A CHILTON PUBLICATION

The Iron Age

THE NATIONAL METALWORKING WEEKLY

March 13, 1952

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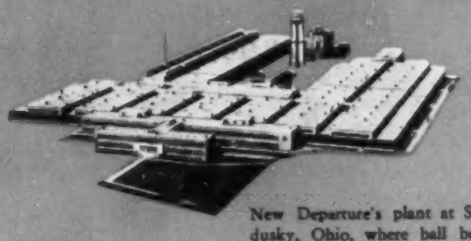
U. S. Army Photo

New Departure operates guns-and-butter plants

At this very moment, New Departure's three great plants are turning out thousands of ball bearings for both industry *and* the Armed Forces—for trucks *and* tanks, jig borers *and* jets, household appliances *and* electronic equipment.

Whatever *your* bearing requirements, feel free to call on New Departure. Its engineers, vast research facilities, and the tremendous capacity of its "guns-and-butter" plants are your assurance of the best possible production schedules.



New Departure's plant at Sandusky, Ohio, where ball bearings are produced for *both* industry and the Armed Forces.

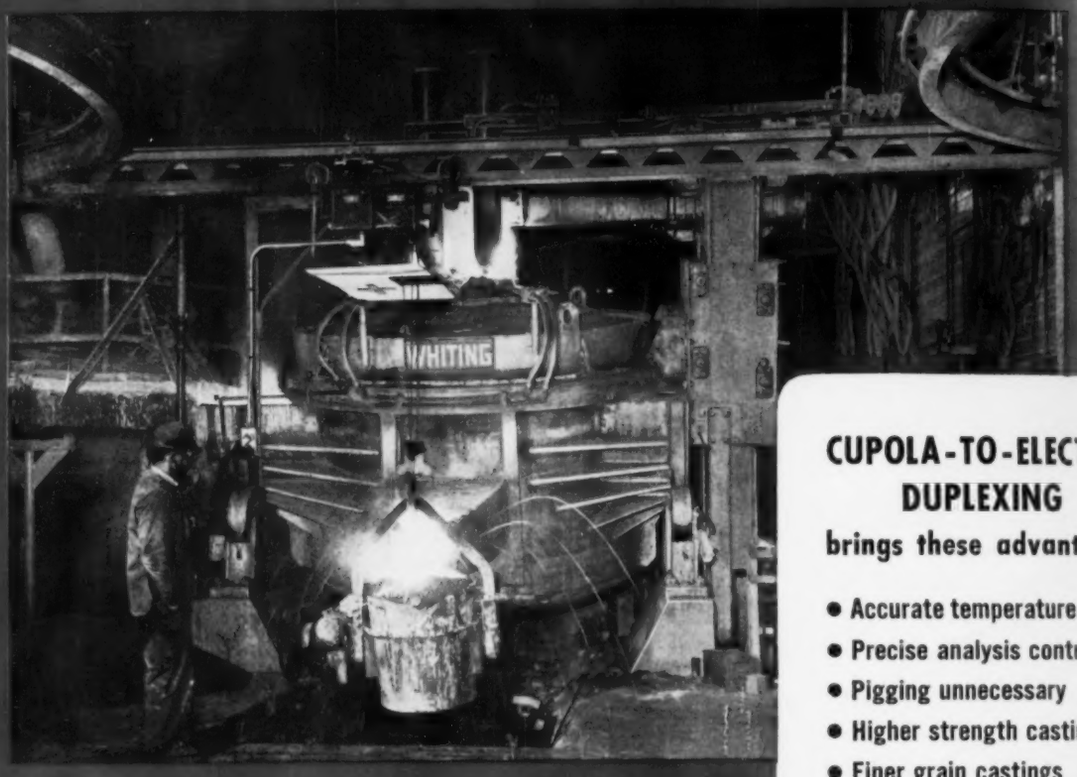
NEW DEPARTURE

Nothing Rolls Like a Ball... BALL BEARINGS

NEW DEPARTURE • DIVISION OF GENERAL MOTORS • BRISTOL, CONNECTICUT

164FC

HOTTER METAL • BETTER ANALYSIS • LOWER COST
with Cupola-to-Electric Duplexing



CUPOLA-TO-ELECTRIC DUPLEXING
brings these advantages

- Accurate temperature control
- Precise analysis control
- Pigging unnecessary
- Higher strength castings
- Finer grain castings
- Permits continuous pouring
- Ladles filled faster
- Pouring delays eliminated
- Increased yield from alloys
- Less machine tool wear and breakage
- Faster machining speeds
- Fewer machine shop rejections

FOUNDRY EQUIPMENT MANUFACTURERS ASSOCIATION INC. MEMBER FEMA

Where Whiting* Cupolas are used for prime melting and a Hydro-Arc* Furnace for finishing, foundrymen secure greatly improved results—in product quality, cost, and ease of operation.

The Hydro-Arc Furnace "levels off" the variable analysis of stratified cupola charges. It permits checking and correcting both the analysis and the temperature of the metal *BEFORE* it enters the mold. A chilled ladleful can be poured back into the furnace to make good castings, instead of pigs and scrap.

Some iron foundries, whose production tonnage does not warrant duplexing, are using only Hydro-Arc Furnaces for continuous or batch melting. This practice is not only practical from a cost standpoint, but it eliminates the uncertainties due to poor quality coke, scrap, etc.

Bulletin FY-168 gives detailed information about the Whiting Hydro-Arc Furnace—write for a copy.

*Reg. U. S. Pat. Off.

WHITING
CORPORATION

15601 Lathrop Ave. Harvey, Illinois

Offices in Chicago, Cincinnati, Cleveland, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, St. Louis, and Seattle. Representatives in other principal cities. Canadian Subsidiary: Whiting Corporation (Canada) Ltd., Toronto, Ontario. Export Department: 30 Church St., New York 7, N. Y.

Corrosion Was a Problem

UNTIL THEY SWITCHED TO MAYARI R

The medicine cabinets and waste receptacles in Bennett Manufacturing Company's line were originally made of mild carbon steel. And, like most products containing this grade of steel, they presented a corrosion problem. For instance, rust would often concentrate at one or two spots and cause considerable damage long before a receptacle or a cabinet had served its expected life.

To solve this problem and to improve their competitive position, Bennett began using low-alloy, high-strength Mayari R. This grade of steel was not expensive and it offered excellent resistance to corrosion. Longer life and all-around better service resulted—they have used Mayari R in their products ever since.

Tests show Mayari R to have from 5 to 6 times the atmospheric corrosion-resistance of plain carbon steel—and 2 to 4 times that of copper-bearing steel. Besides this, it retains paint 20 to 80 pct longer than carbon steel, depending, of course, upon the type of paint used.

No matter what you manufacture, it will pay you to investigate this versatile grade of steel. Our Catalog 259 explains in detail how Mayari R has been used to advantage in products ranging from locomotives to flatirons. Write for a copy.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

Mayari R *makes it lighter... stronger... longer lasting*

IRON AGE

MARCH 13, 1952
VOL. 169, No. 11

THE IRON AGE
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DIGEST

of the week in metalworking

PAGE 53 **WHAT TO KNOW IN WAR WORK SCRAMBLE**
Before a small plants owner can get into the thick of the battle for limited defense contracts, he should be equipped with the facts on military procurement complexities, financing contracts through loans, the fast tax writeoff system. Evaluating his position he can then take surer aim at contracts.

PAGE 54 **AWAIT IMPACT OF AIRCRAFT CUTBACKS**
A month ago the Air Force's engine program was grounded for inspection. Subcontractors are now trying to get their bearings. They will feel force of cutbacks in the second, third quarters. It may mean a 30 pct production flop in that period. A flood of tool cancellations is not expected.

PAGE 56 **MUST STEEL INDUSTRY RISK A STRIKE?**
Blundering by wage and price stabilizers could shove the steel industry into a corner. It may be forced to risk a strike. One of the reports coming from the Capitol has it that steelworkers will get a wage boost of 18½¢ an hr while steel gets a rise of $3 a ton—sure to be rejected.

PAGE 58 **KILL NEW ALUMINUM EXPANSION OVERNIGHT**
DPA proposed a 150,000 ton expansion, a 4 million-ton stockpile by 1963 and a big Canadian deal. Industry talks showed the shaky foundation the idea was based on and the first two measures were dropped. Fabricator pressure may yet close the Alcan deal but delivery would wait till 1955.

PAGE 59 **U. S. EXPORT-IMPORT GAP WIDENS FURTHER**
Export imbalance of $4 billion over imports during 1951 was an 185 pct increase. This represents a high jump from 1950. Shipments both ways were at record highs last year, but imports have been off since April. A closer trade ratio should be coming forth in the near future.

PAGE 60A **WEST LEADS STEEL CAPACITY RISE RACE**
The steel industry showed a net capacity gain of over 4 million tons last year, or 3.91 pct over 1950. Outpacing other districts, the West Coast built 18.66 pct of new facilities. Philadelphia built 13 pct; Cleveland, 12.80 pct; Chicago, 11.96 pct. Pittsburgh gained 8.80 pct of total growth.

PAGE 71 **HOW SINCERE IS NPA IN STEEL DECONTROL?**
Take with a grain of salt statements from Washington planners about how decontrol of steel is near. Bureaucracy is reluctant to admit its supply-demand strategy has gone astray. It admits softening of the steel market only because it's undeniable. Congress may have to force decontrol.

PAGE 93 **BETTER MATERIALS FOR NUCLEAR REACTORS**
Reactor materials must meet high physical and thermal requirements. Titanium, zirconium and beryllium offer possibilities as construction materials. Bismuth, lead, potassium, and sodium may make liquid metal coolants. Ceramics, ceramic-metallics, have unusual high temperature properties.

PAGE 98 **MACHINE BEARING BALLS WITH ELECTRICITY**
Bearing balls are machined electromechanically in a Russian plant. Balls roll between charged upper and lower discs. Microarcs soften ball surfaces and rotating disc throws off softened metal particles. Surface is left slightly pitted and decarburized, so final operation is hard lapping.

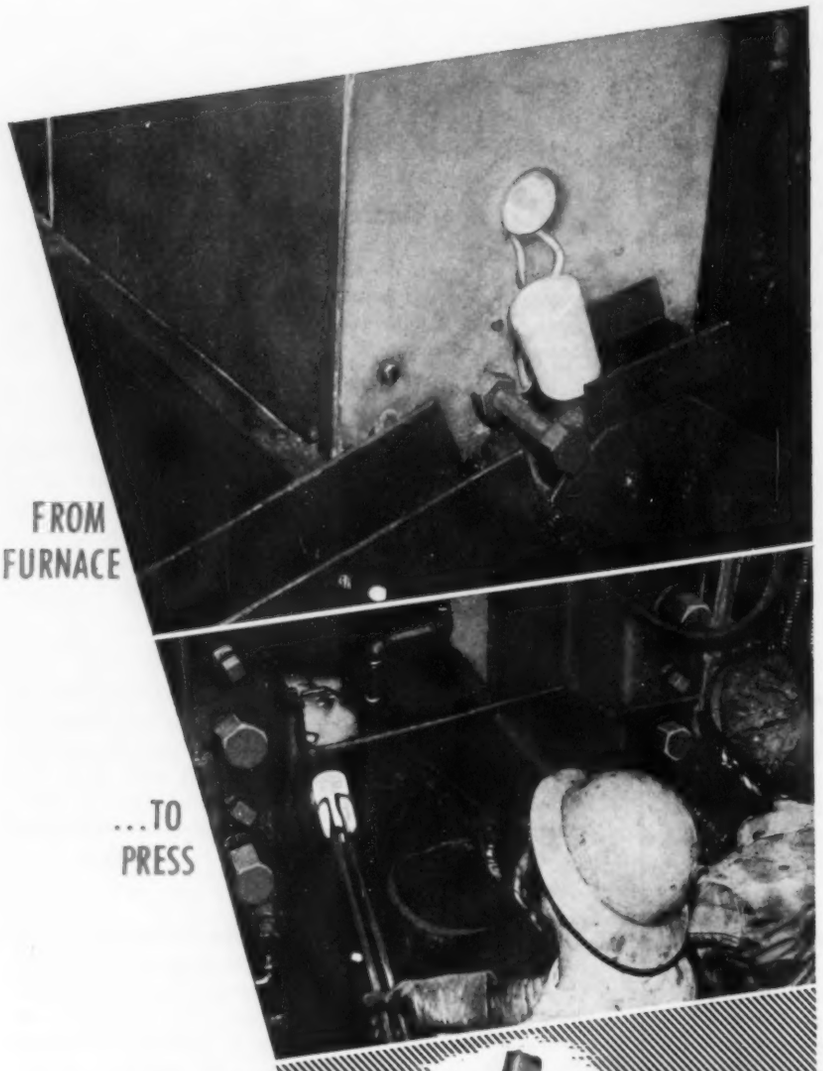
PAGE 100 **UNUSUAL UPSET FORGING MACHINE IN USE**
Besides producing forging blanks for jet engine blades this machine also makes valve stems and other machine parts. It combines resistance heating with a hydraulic ram and a moving anvil. Close control is achieved without dies. The machine is capable of upsetting 40 times bar diameter.

PAGE 147 **STEEL WAREHOUSES SEE INVENTORY BALANCE**
Warehouses are moving quickly to bring their steel inventories into balance. Generally, they're cutting down buying cold-rolled sheets, strip, and some other light products. But they are redoubling their efforts on heavy plates and structurals. They expect better inventory balance soon.

NEXT WEEK **FOUR NEW MACHINING METHODS EVALUATED**
Electrolytic, electro-arcing, electro-sparking, and ultrasonic processes show promise for such machining jobs as tool grinding, die finishing, and shaping titanium jet engine discs. Two of these processes are already being used commercially. They may solve the diamond bort shortage.

Saves ten tons of steel a day-

WITH AJAX-NORTHRUP INDUCTION HEAT



Improved forging methods, using Ajax-Northrup induction heat, have reduced billet weights for these axle spindle forgings from *7½* to *5¼* pounds. Resultant steel savings add up to *ten tons* of SAE 5132 bar stock a day!

Up to 720 scale-free billets per hour are fed directly from an Ajax-Northrup heater to 1750-ton Maxipress extrusion presses. Forgings are formed in one operation, saving time and labor, and reducing floor-space and equipment requirements.

Ajax-Northrup heat saves up to 20% of original billet weight. First, by elimination of scale, and second, by accurately controlled, even, penetrating heat which permits forging to extremely close tolerances . . . 2 ounces for an 8-lb. connecting rod, to quote another example.

Better heat means better fiber flow, too. As a result, fatigue resistance of the axle spindles is reported to be 17.3% better than that of conventionally heated, hammered forgings.

Ajax-Northrup can save steel, time, and labor in your plant, too. Write us today . . . call on our 35 years of induction heating and melting experience.

SEND FOR NEW INDUCTION HEATING AND MELTING BULLETIN

136

FOR HEATING AND MELTING

AJAX NORTHRUP

AJAX ELECTROTHERMIC CORPORATION

AJAX PARK
TRENTON 5, NEW JERSEY

Associate Companies

AJAX ELECTRO METALLURGICAL CORP.
AJAX ELECTRIC FURNACE CORPORATION
AJAX ELECTRIC COMPANY, INC.
AJAX ENGINEERING CORPORATION

The Iron Age
FOUNDED 1855

All Things To All People

SOME day we will reach the millennium. Then we will act out the teachings of Moses and Christ. Many are doing it now in their small way but we are a long way from that idealistic world where everything is based on love of one for the other.

There is no reason why all of us can't try to make that time come sooner than it might otherwise come. Such a goal is good for every one of us. We yearn for that blissful state. We don't realize that we have to work hard and long for such a utopia.

There is a bit of this holy searching in our attempt to help people everywhere. We want to help plow the furrows in India. We spend money to raise peanuts in far off never-never-land. We want to arm and equip the free people of the world so they may hold back greed, barbarism and communism.

We talk about what we want to do. We think it is only a matter of a few billion more. What is a billion to a country whose yearly income is now more than $275 billion? In our policy makers' tent in Washington we have people who dream of the new world to come. They want it to come fast.

It will be hundreds of years (or maybe thousands) before the kind words we talk and thoughts we have will be an international way of life. It will be sometime too before the menace of communism is pushed back by ideas as well as military might.

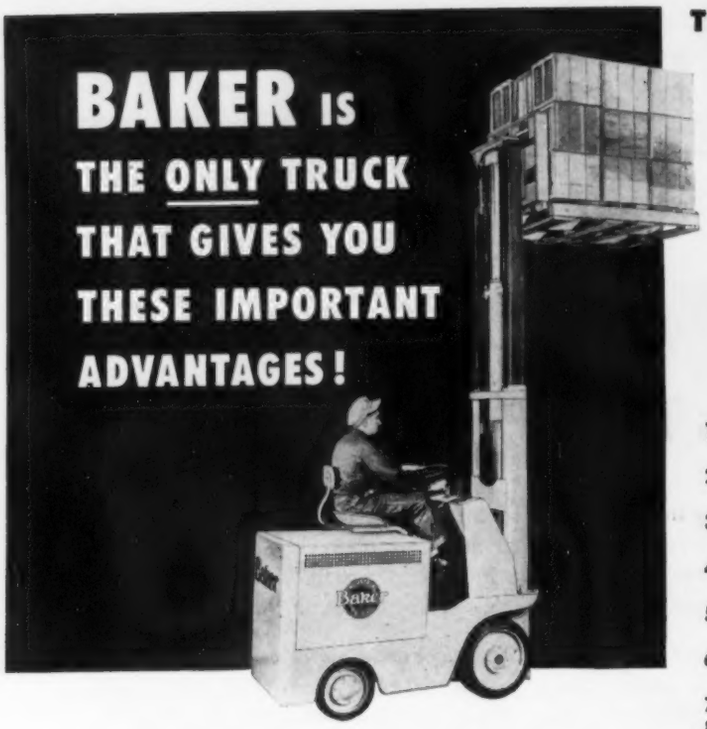
Many of us feel that America is unlimited in its resources and its ability to help everyone everywhere. There are enough people in power to preach this doctrine and put it in motion. There are enough others who will go along with such a campaign. It is a good goal but there is a catch to it.

We are great because we have strength, money and resources. Some of this was gained by hard work; much by the grace of God. We are now at a point in our history where we must spend more wisely and make intelligent decisions else the very strength we have that enables us to help others will be sapped away. A strong brother who continues to help a weak one until he reaches the same condition is no longer a positive force.

Tom Campbell

Editor

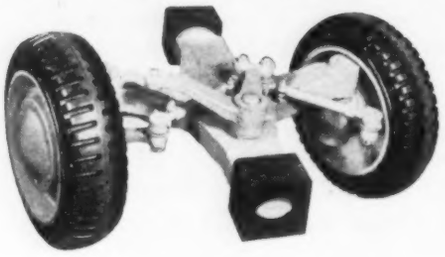
BAKER IS THE ONLY TRUCK THAT GIVES YOU THESE IMPORTANT ADVANTAGES!



THE MOST EFFICIENT POWER AXLE FOR INDUSTRIAL TRUCKS

1. Exclusive Baker worm drive outlasts all other drives.
2. Single-step reduction gives greatest efficiency and quiet operation.
3. Rolling contact between worm and worm wheel eliminates sliding friction.
4. Alloy-steel worm and aluminum-bronze worm wheel for strength and low friction.
5. Worm runs on radial and thrust ball bearings to protect against damage from shock loads.
6. Four-bevel-pinion differential doubles tooth contact, distributes load evenly, minimizes maintenance.
7. Efficiency not reduced by wear.
8. High efficiency under heavy loads.
9. Lowest operating cost of any drive.
10. Can be removed from truck in less than 1 hour.
11. Full floating axle shafts easily removed.

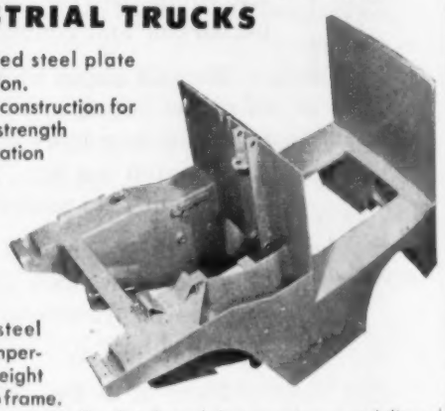
THE SIMPLEST TRAILING AXLE FOR INDUSTRIAL TRUCKS



1. Baker patented wide angle steer provides maximum maneuverability.
2. Jumbo-size oil resistant rubber blocks absorb twisting of axle.
3. Complete accommodation to uneven roadways.
4. Effective snubbing of road shocks.
5. Constant smooth traction on drive wheels.
6. Proper steering geometry minimizes scrubbing of tires.
7. Steering connections above axle for protection from damage and maximum underclearance.
8. Thrust ball bearings and location of knuckle pivots mean easiest, shockless steering.
9. Tapered wheel bearings reduce friction.
10. Wheel removable in 5 minutes by taking off cap and one nut.
11. Trailing axle can be removed from truck in 20 minutes.

THE STRONGEST FRAME FOR INDUSTRIAL TRUCKS

1. All-welded steel plate construction.
2. Box-type construction for greatest strength and utilization of space.



3. Integral steel plate bumper-counterweight welded to frame.
4. Weight scientifically distributed for maximum stability and cantilever effect.
5. Integral oil reservoir.
6. Designed for easy access to truck components requiring maintenance.
7. Designed for quick, easy removal of mast, power axle and trailing axle.

Yours for the Asking!

Just off the press . . . 16 page manual "CARE and MAINTENANCE OF INDUSTRIAL TRUCKS." Write for your copy today.

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1227 WEST 80th STREET, CLEVELAND 2, OHIO • *In Canada: Railway and Power Engineering Corp., Ltd.*

Baker® INDUSTRIAL TRUCKS

Dear Editor:

Letters from readers

Belt Drives

Sir:

In your Feb. 21 issue we have read with interest the article "Power Transmission Through Belts" by John E. Hyler. He describes a device for maintaining constant speed on a center drive wind up in order to obtain constant tension of the web.

We have investigated various methods of obtaining such a constant speed automatically but have found some objection in all of them. Could you tell us if the mechanism described is being manufactured commercially and if so by whom? We would be very interested to have more details on this drive.

G. UPTON, JR.
Engineer
American Sandpaper Co.
Rockland, Mass.

More information can be obtained from Allis-Chalmers Mfg. Co., Milwaukee, the manufacturer of this equipment. The captions on p. 106 were accidentally transposed. The tension device is the one pictured on the left of this page.—Ed.

Still Interested

Sir:

In your Dec. 14, 1950, issue there appeared an article "Industrial Glove Salvaging." We would like to have the address of the company, U. S. Industrial Glove Corp., which at that time was engaged in this service.

We would appreciate this information since we feel that this article may give us a clue to a substantial reduction in our cost for gloves in this plant.

W. J. OLSON
National Radiator Co.
Duncansville, Pa.

The U. S. Industrial Glove Corp. is located at 9340 Roselawn Ave., Detroit 4, Mich.—Ed.

Lower Alloys Developed

Sir:

The article "Lower Alloys Developed For High Temperature Use" by C. L. Clark appearing in your Feb. 21 issue is certainly an apt and timely piece of work.

We have done considerable work with the 1722A(S) alloy and can report that it is readily cold drawn into tubing. We would very much appreciate three copies of this article to complete our files.

H. W. COOPER
Development Metallurgist
Superior Tube Co.
Norristown, Pa.

Thrifty

Sir:

The Aug. 16, 1951, issue of your magazine carried an article entitled "To Save Money Conserve Alloy in Repinning Your Furnace Belts" by Roger Williams.

We intend to publish this material in rearranged form and would like very much to obtain the two photographs used to illustrate the article. We have approval from Standard Alloys Co., Inc., to republish this information.

E. J. BARRETT
International Nickel Co., Inc.
New York

Conservation

Sir:

The articles "New Generators Save Copper, Steel" and "Reclaiming Alloys From Tool Steel Mill Wastes" appearing in your Nov. 1, 1951, and Nov. 8, 1951, issues, respectively, are of particular interest to us in connection with our efforts to conserve critical materials. We would therefore appreciate receiving a reprint of each article for our continued reference.

H. C. WOLFE
Mills, Petticord & Mills & Associates
Washington

For The Record

Sir:

An item on p. 116 of your Feb. 7 issue states that the Lebanon Steel Foundry, Lebanon, Pa., has what is believed to be the only color motion picture devoted entirely to the manufacture of steel castings. Our motion picture "Sand and Steel" in full color was introduced in 1950 and is concerned exclusively with steel castings.

L. KELLEY
Mgr., Public Relations Dept.
Allegheny Ludlum Steel Corp.
Pittsburgh

Corrosion Control

Sir:

Reference is made to the article entitled "Stress Corrosion of Cast Bronzes Evaluated" appearing on p. 85 of your June 21, 1951 issue, along with tables and illustrations.

We are presently in the process of incorporating our efforts with those of our regional offices into an active corrosion control program and would appreciate a copy of the above mentioned article.

R. L. BEAVERS
Chief, Lighting & Structures Maintenance Branch
Dept. of Commerce
Civil Aeronautics Administration
Washington

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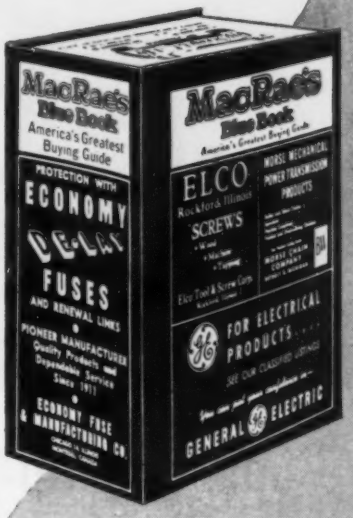

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ILLINOIS

AT WENDT-SONIS A LINDBERG INDUCTION HEATING UNIT

ups tool tip brazing 135% . . . replaces two units

Production brazing of carbide tip tools has soared from 270 to more than 600 an hour since Wendt-Sonis, Hannibal, Mo., tool manufacturer, installed a Lindberg induction heating unit.

Two operators, fluxing parts and putting brazing metal and carbide tool tips in place, load the assemblies on a conveyor belt that passes a continuous stream of work through a specially designed, long hair-pin type heating coil.

Production is speeded because 14 tool assemblies . . . not just one . . . are in the heating field at any given time. The first tool on the conveyor passes *from* the heating area, leaving 13 others *still in* the field of heat, with tool number 15 *just entering* the coil area.

Production, formerly through two smaller units, totalled only 135 tools per hour, per unit, and required four operators. Thus the new equipment frees two operators for other important work.

If your requirements call for production brazing, soldering, hardening, annealing, stress relieving, hot forming, forging or shrink fitting, a Lindberg induction heating unit can better your production picture . . . minimize costs . . . increase profits.

Bulletin 1440 gives additional details. We'll be glad to send you a copy.

Booth 1333 . . at the American Society of Tool Engineers Exposition, March 17-21 in Chicago, is the Lindberg booth. You'll see, in operation, an induction heating unit, brazing tool bits.

You'll see tiny model furnaces showing recommended tool room arrangements. You'll see demonstrations of air and hydraulic cylinders.

TOUR No. 7 . . . Be sure to sign up for a tour through the huge Lindberg Steel Treating Co. plant . . . starting from the Conrad Hilton (Stevens) Hotel at 9:00 A.M. Monday, Tuesday, Thursday and Friday.

LINDBERG *HIGH FREQUENCY DIVISION*

Lindberg Engineering Company, 2450 West Hubbard Street, Chicago 12, Illinois

the IronAge
FOUNDED 1855

THE IRON AGE Newsfront

► Newest use of the electrolytic machining process is by the Atomic Energy Commission for cutting radioactive metals.

► Air Force payments to contractors in the Midwest have been drawing closer to the value of contracts let, indicating that the defense slowdown is already apparent. But more obvious effects will probably not be felt until the second quarter.

► Controls on the number of automatic transmissions permitted for passenger cars may soon be lifted by NPA, auto men expect. From a market standpoint, it would be helpful if the units could be offered on more than a third of the output of lower priced cars.

► Magnesium manufacturers are looking to the commercial vehicle wheel market. Aluminum has been in the field for some years. Feeling is that while the advantages of magnesium's light weight would not warrant the added cost on passenger cars, higher payload might offset it on trucks.

► One of the nation's biggest machine tool builders is quietly developing a revolutionary machine for a government agency. It is reported to combine electro-mechanical and electrolytic machining processes.

► The Steelworkers' union still has not managed to get all its contract dates arranged to suit its bargaining convenience. So there is a push to get all plants of a single company onto the same contract termination date.

Also, for easier handling, some locals want smaller plant contracts to be dated about a month or two beyond that of U. S. Steel. This would save some trouble but would weaken the national effect of a strike.

► High speed radio guided submarine robots have been reported operating in the Baltic Sea.

► Some prime defense contractors are having trouble getting subcontractors. Many potential subcontractors can't afford to tie up equipment and space for phantom orders that may never become firm. Many of those who have done so are sorry. One firm lost heavily on an electronics part--a relatively simple item which finally incorporated over 400 design changes.

This much is fact now--unless there is an all-out war subcontracting will not develop on the grand scale contemplated by many in industry last year.

► Machine tool builders are afraid they will get the same treatment on controls that steel has been getting. While the overall industry backlog is heavy (18 months), some producers could now take non-rated orders and must have them soon or start losing labor.

► The fact that titanium can not be brazed with commercially available alloys has been turned to good advantage. This quality has proved helpful in silver soldering on a type 321 stainless steel assembly where titanium strips act as dams to hold the solder in place.

► Prior to Korea the drive to reduce the number of alloy steel grades was making good headway, but since then they have climbed to some 270, a gain of about 100. Based on alloy content, three broad ranges are recognized now: (1) High--for AEC, Navy and Air Force; (2) medium--for general military; and (3) lean--for most civilian applications.

At the World's Largest Slag Plant—owned and operated by Birmingham Slag Company, Birmingham, Alabama.

AUTOMATIC CONTROL

Does What Human Hands Couldn't Do

●

Production schedule, averaging one trip per minute, now easily maintained.

New EC&M FREQUENCY RELAY Controller slows bucket by plugging to prevent overtravel and derailment of cars. Power occasionally re-applied as trip ends.

Previously, manual jogging by skilled operator could not always avert delays, even though down-car was aided by engaging counterweights to offset over-hauling effect of car going over the knuckle at the top.

THE PROBLEM:

How to govern speed *from the ground level* as the loaded bucket reaches the top, levels out and quickly tips to dump. The motor load, a maximum driving value on the upgrade, falls off as the bucket levels out, and changes quickly to maximum *overhauling* as the bucket jackknifes to dump. An operator has little time to "feel" or judge the motor load under such swift or sudden changes.

THE SOLUTION:

EC&M Frequency Relays respond accurately to the slip-frequency of the wound-rotor hoist motor. As a loaded bucket reaches the top, plugging is automatically applied by the limit switch and the bucket reaches the end of travel with motor speed reduced to 17% or less. An empty bucket going over the knuckle operates in like manner. With a *heavily loaded* bucket, power may be re-applied after plugging but the motor seldom speeds up to a point where a second "plug" is required before the trip is ended. EC&M Frequency Relays provide a simple, accurate method of controlling plugging and accelerating contactors for smooth operation of the a-c skip hoist.

Write for your copy of EC&M Frequency Relay Controller Bulletin 9303-SK.

Contacts Lasted 3 Months—
No Replacement Now in Over 2 Years

Previously, frequent jogging handling heavy currents accelerated contact wear. Since converting to automatic operation by Frequency Relays, movements are a minimum and examination after 2 years indicates no replacement will be needed for some time.

THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79TH STREET • CLEVELAND 4, OHIO

WAR WORK: How to Meet Military Procurement

Two-sided attack of cutbacks and slipping civilian demand prods some small plants toward defense work . . . They must face military procurement and financing — *By T. Metaxas.*

Tilting back in his desk chair, Roger S. wearily draws his hand across his eyes. He has just finished reading another government manual on "How to Do Business with the Army." With clarity the pamphlet spells out to him the ways to bid for contracts but, of necessity, it dwells but vaguely on what he's really interested in—how to make a partial transition from the civilian widgets his plant produces to a related defense product.

And that he has to do—because materials cutbacks have diverted a great deal of his copper and aluminum and some steel to imperative war needs. His widgets have been labeled low-essentiality civilian goods and Roger has nothing else to turn to. Despite his producing standard and deluxe versions of widgets, Roger's specialized machinery is committed to a single product line.

Across the street a large firm makes 25 different products and not all have been classified as low-essentiality. It has been able to roll with the allocations blow, losing some production but maintaining most. But Roger can't say the heck with widgets and shift to other products. And he does not have a staff of bright-eyed young engineers to create design changes and plan substitutions.

Two Strikes — Nor does Roger have an office in Washington outfitted with legal minds honed to alertness on matters of military procurement. His only crutch is his own ingenuity—and that's a little rusty. Roger resents the large firm's balancing civilian production deficits with defense work while he clutches at air. Two strikes against Roger are confusion and inexperience and until this time he's been a reluctant batter, not really desiring to enter the risky field of defense work.

At the onset of World War II the mass of America's industrial plant swerved suddenly into war. Roger could be choosy about war jobs and was begged for unflagging haste. Military procurement under the current twilight state of war and time-table rearmament is at a leisurely dog-trot instead of a total-war sprint.

And as if materials cutbacks were not irritating enough, Roger's civilian market for widgets slumbers. In back of his mind is the fear that even if he does get more allocated metals he will not be able to unload the fruits of expanded production.

To protect his metals supply and take him back a few steps from a frail civilian market, Roger must get a few government contracts. Competition for war jobs is growing fierce and to Roger procurement is baffling.

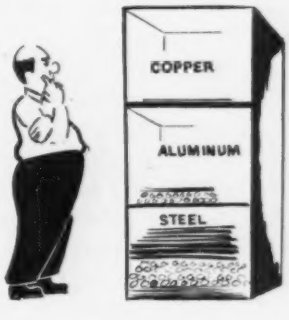
What are some of the pitfalls Roger must recognize before he's fit to face military procurement? First of all, procurement men have not been needled to a frenzy by mobilization pressure and they may hew to set practices. They are tempted to deal mostly with firms

War Work—Exclusively for Small Business

Small Defense Plants Administration is the brawniest Washington shoulder for the small businessman to weep upon. In flailing out in all directions to direct more defense contracts to small plants, SDPA is now implementing a "joint determination" system.

An SDPA man will sit in with an area military procurement official to establish a specific percentage of contracts to be assigned exclusively to small business. The SDPA man will work on the principle that any war work that small plants can do just as successfully as big business they should get.

Big business will be excluded from competing for the small business slice. Contracts may also be broken up for ease of handling. Negotiated contracts may receive more stress. The procurement man also can pay price differentials (higher prices) to aid small plants and distressed areas.



that have done the job before. Investigating production facilities and credit standing of "new" plants means unnecessary fuss.

Advertised Bids — Procurement men still put their faith in advertised bid contracts while the anticipated upsurge in negotiated contracts has not materialized to any substantial extent on the small plants level. Since negotiated contracts are restricted to relatively few competitors the small businessman has a sounder chance of meeting other bids. Battling for advertised bid jobs is jungle warfare.

The present pattern of procurement whittles down Roger's hopes of a war work deluge. It is stressing the heavy end products—tanks, guns, planes—to build the central core of an expansible army. Making the fringe knick-knacks for added millions of troops will come later—if at all. Because of this Roger and other small businessmen have lost an important market for soft goods and smaller metal items.

Roger has gone through preliminary motions of clearing the decks for war work. In a booklet Roger listed his machinery, equipment, space, products and with some pride dispatched it to prime contractors and procurement offices. But the booklet had one failing.

Roger had not pinpointed the parts or products he could make that were specifically needed by defense. He was striking out in the dark, expecting procurement men to tell *him* the things he could make. Survival is a serious business. Roger must find his own jobs.

On Roger's desk is a military procurement notice inviting bids on contracts. This one's circulated by the area's general trade association. Roger's been studying it but he's been held back by the inertia of uncertainty. Possibly his machines can be modified at small cost (that's important when expensive retooling is no absolute

guarantee of more identical contracts) to produce "X" item for the Army. He decides to send for the specs to see if his plant is suitable and to formulate some sort of a bid.

Engineering Advice—When the specs come he had better invest in some competent engineering advice. He has to be doubly sure that he can convert profitably and bid realistically. Procurement men gnash teeth when small businessmen offer to make a historic $10 item for $1.50. That bid is snubbed because under law procurement people are obliged to award contracts to "responsible" bidders. A poor introduction for any firm is a ridiculous bid.

Roger is prepared to subdue his hankering for big profits and bid as low as possible to earn that first contract which may open the gates for more. He prepares to consider that if he's bidding on a job from a remote procurement office, shipping charges may be held against his bid. He must make certain that he understands all the specs—and tolerances are closer today. A profitable job can degenerate into a dead loss if he glosses over one machining spec.

Military listings of products purchased under previous contracts can serve Roger as a guide to what will be bought in the future. If he can determine what product he can make that is bought recurrently, he can get himself on the negotiated contract mailing list for that item. But he should send some remark to answer every procurement inquiry, even if he's not interested or eligible. Otherwise he's stricken off the roster.

Assuming that Roger is able to bid on a contract, what about his financing? His cash box isn't chock-full and compared to some of his bigger brethren he's a penny ante operator with little economic stamina. Roger will have to lay out production costs and pay for equipment modification.

Financing—As a small businessman Roger is geared to quick payment to finance new work. After completing a war job he may have to wait months for his check—and Roger feels this would be too dangerous.

He knows that the government has provisions for such contingencies. If eligible, he can apply to Small Defense Plants Administration for certification to receive a loan out of Reconstruction Finance Corp.'s $100 million small business kitty. The right of approval rests with RFC.

A hangover from World War II is the V-Loan. Roger can apply to his local bank for a defense loan. The bank can turn to Washington for a guarantee of a substantial percentage of the loan. Only in cases of default does Washington enter the picture. Some small business champions believe that this system has a few rotten spots because military departments have shown a tendency to wash out of negotiations plants applying for V-Loans.

It's more expedient to find another small plant which can do the job without a loan—even if the price is a little higher. Authority to wash out the plant seeking a loan rests in procurement's "responsible party" clause. If Roger hopes to win an advertised bid contract, the V-Loan is a hindrance. Procurement men can disqualify bidders who base financial stability claims on V-Loans.

Subcontracts — Roger has another hope for defense work—through subcontracts from a prime contractor. But he understands that primes rely first on their echelons of traditional suppliers for subcontracting services. And some of the suppliers have complained they've been forced to take on unwanted short-run defense subcontracts just to keep relations friendly.

Besides, being a supplier and

Turn to Page 68

AIRCRAFT: Will 30 Pct Cutback Strike?

Full impact of aircraft engine slowdown will be felt in next two quarters . . . Few outright machine tool cancellations expected as result . . . Industry still busy—*By K. M. Bennett.*

Four weeks ago the Air Force's engine program was grounded. The subcontractors who had signed up for the trip are now trying to get their bearings. The fog is lifting, but visibility is still poor.

This much is known. Thousands of metalworking subcontractors in the aircraft engine program can expect to feel the full impact in the second and third quarter. It may mean a 30 pct cutback from production anticipated for that period.

Machine Tools — Defense contractors and the Air Force do not plan a flood of machine tool cancellations. Where the defense contract is wiped out entirely, as with Fairchild, at Chicago, or Fisher, machine tool orders will be cancelled. But defense contractors who are approaching production, or are already producing, can be expected to accept the machine tools that they have ordered. Since these producers are waiting now for machine tools that may take anywhere from 9 to 18 months in delivery, the backlog is expected to tie up machine tool production facilities for quite a while. And these primes continue to have high priority ratings.

One engine producer points out that this is cheap insurance. The backlogged machine tools constituted about 7 pct of the total remaining value of his facility contract (awarded for building or renovating a plant capable of producing aircraft engines). They were undelivered but would increase his production potential by 40 pct.

But with the planned production curve now cut there will be open time on some machine tools. Some of these will be returned to government reserve storage sites for use by other high priority defense contractors. (This is regarded by defense officials as a small percentage, however.) Others will go to the contractors who ordered them, to be kept in the plant on a standby basis. Some of these may even be used for civilian production, if the government later concurs. Watch for the acceptance of other defense contracts with other defense agencies by manufacturers wanting to fill up open time on machine tools originally scheduled for all-out engine production. A few are dickering tentatively. The tools are and will remain government property.

Labor—Engine manufacturers' demands on the skilled labor pool will continue to expand, though at a slower rate. The cutback amounts to a 12 to 18-month extension of production goals. The present labor force will not be cut. Straining after engineering personnel will be less feverish as a result of the slowdown.

Materials — There will be no easing in high alloy steels. Engine manufacturers have A1 priorities or the benefit of National Production Authority directives. None of them were caught with a stockpile of high alloys when the cutback hit. Illustrative of the nerve-stretching demand for jet materials — one large engine producer-assembler had to close down his foundry for 3 days. Not a scrap of metal in the plant and this despite a high priority reinforced with NPA directives. Toughest material problems remain in the nickel-bearing, columbium and columbium-tantalum materials. Another source of major concern has been the high cost of these metals, according to one producer.

One weak point in the procurement program will be eliminated. "B" class items earmarked as warplane components will be expedited by NPA. In too many cases producers of low priority items were being starved out.

Subcontractors—Literally thousands of smaller plants, producing a high percentage of the parts used by the primes in assembly, are expected by the Air Force to feel slowdown effects fully in the third quarter. Primes feel it will arrive sooner—in the second quarter. Some will be dropped—principally those who were suppliers on paper only at this early date. Others will have their planned output cut by 30 pct.

Jet Engines—This program is far from concrete. Changes will affect local materials, labor, and subcontract picture. Currently scheduled for production are 14 different jet engine models, to be built in 50 types.

Reciprocating engines, still a very live part of the aircraft power plant picture, will be built in six models having 22 different types. Prime engine producers expect standardization, with a further cutback in production of some of these types. Inability of some large primes to meet even present production schedules lead them to believe that additional contracts might be let to other producers. Hence the cutback might not be a cutback in all cases. It does mean a vast tieup.

"After analyzing the wasted motions in your department, Harrison, we find your jaws head the list."

STEEL: Must Industry Risk Strike?

Washington should consider that an inadequate price rise may shove industry in corner . . . It may risk strike on Mar. 24 . . . Capitol reports irk steelmakers—*By J. B. Delaney.*

If wage and price stabilizers don't walk gingerly and consider all the angles, they could force a shutdown of the steel industry.

They should realize by this time that if the issue is important enough the steel industry will risk a strike rather than knuckle under.

In 1946 a wage-price dispute similar in some respects to the current one led to a strike of the industry. And in 1949 the steel producers were shut down for more than a month before they agreed to accept pension recommendations of a fact-finding panel.

There are issues involved in the present wage-price dispute that could lead to a strike, as THE IRON AGE has pointed out previously (Feb. 28, '52, p. 55). Most important of these is steel prices.

Trouble Ahead — The Administration has demonstrated many times its sympathy toward labor. If some of the reports supposedly emanating from Washington indicate serious governmental thinking on terms for settling the controversy, trouble lies ahead.

One of these reports says the United Steelworkers of America (CIO) will receive a wage increase of 18½¢ an hr while the industry is permitted to increase prices $3 per ton.

Won't Be Acceptable—The steel industry will reject any such recommendation. It has stated repeatedly that it must have a price increase sufficient to compensate for increased labor costs. And $3 per ton is not the industry's conception of a fair trade for 18½¢ an hr. Some steel leaders would balk at $6 per ton.

Admiral Ben Moreell, chairman of Jones & Laughlin Steel Corp., last Friday called attention to "certain government officials" who he said believe the wage-price dispute can and should be settled "without consideration of the steel companies to carry the increased wage costs."

"Any wage increase," he said, "must be considered in the light of the ability of the companies to pay the increase without impairing their financial stability or incurring the risk of bankruptcy.

"Wage costs and price structures in the steel industry are tied together as firmly as were the Siamese Twins. Any attempt to cut them apart even by the most skilful and well-intentioned surgery would be fatal to both."

Also, a factor largely overlooked outside the industry is that of competition. Permission to increase prices is hardly a comfort to a steel producer who knows he will have to sharpen his pencil when the going gets tough in the market place. This could happen in the next year, barring another war.

An industry rejection of the Wage Stabilization Board's recommendations would lead to a strike Mar. 24.

Unions Dig In—The USW would waste no time shutting down the industry. Union President Philip Murray has indicated his belief that by Mar. 24 the USW will have complied with the 80-day cooling-off provisions of the Taft-Hartley Act since its original strike deadline was Jan. 1. This position may be disputed but the industry is likely to be idle during the argument.

Already some union locals are making strike plans. In Youngstown, Local 2163 has set up a strike headquarters near the Poland Ave. entrance of the Youngstown Sheet & Tube Co.'s Campbell Plant. Picket duty schedules have been arranged and various strike committees appointed. Other locals in the Youngstown area were scheduled to meet this week to consider similar plans.

IRON & STEEL: January Output By Districts

As Reported to the American Iron & Steel Institute

BLAST FURNACE —NET TONS DISTRICTS	Number of Companies	Annual Capacity	PIG IRON Jan.	PIG IRON Year to Date	SPIEGEL, FERRO-MANGANESE Jan.	SPIEGEL, FERRO-MANGANESE Year to Date	TOTAL Jan.	TOTAL Year to Date	Pct of Capacity Jan.	Pct of Capacity Year To Date
Eastern	12	13,983,580	1,142,439	.....	26,510	.....	1,168,949	.....	98.7	.....
Pitts.-Yngstn.	17	27,468,800	2,267,957	.....	28,209	.....	2,296,166	.....	98.7	.....
Cleve.-Detroit	6	7,501,100	593,677	.....		.....	593,677	.....	93.4	.....
Chicago	7	15,703,740	1,242,153	.....		.....	1,242,153	.....	93.3	.....
Southern	8	5,648,620	445,326	.....	5,645	.....	450,971	.....	94.2	.....
Western	3	3,476,700	287,675	.....		.....	287,675	.....	97.6	.....
Total	35	73,782,340	5,979,227	.....	60,364	.....	6,039,591	.....	98.6	.....

STEEL —NET TONS DISTRICTS	Number of Companies	Annual Capacity	TOTAL STEEL (Incl. Alloy Steel Carbon Ingots) Jan.	TOTAL STEEL Year to Date	Pct. of Capacity Jan.	Pct. of Capacity To Date	ALLOY STEEL Jan.	ALLOY STEEL Year to Date	CARBON INGOTS Jan.	CARBON INGOTS Year to Date
Eastern	23	21,709,870	1,802,353	.....	98.0	.....	142,739	.....	363,851	.....
Pitts.-Yngstn.	33	42,350,760	3,562,564	.....	99.3	.....	523,548	.....	401,553	.....
Cleve.-Detroit	8	10,485,380	880,064	.....	99.1	.....	73,348	.....	85,502	.....
Chicago	15	22,258,500	1,894,155	.....	100.4	.....	151,801	.....	294,535	.....
Southern	10	5,291,260	469,438	.....	104.7	.....	7,328	.....	1,998	.....
Western	12	6,491,900	527,543	.....	95.9	.....	10,097	.....	38,254	.....
Total	79	108,587,670	9,136,117	.....	99.3	.....	908,861	.....	1,183,693	.....

Salvage:

Recovery of fired shells from Korea saves brass, your money

Empty shell cases from Korea (below) are saving vital raw materials and helping to pay for new ammunition.

Fired brass cartridge cases are collected on the battlefields and shipped to Red River Arsenal, Texarkana, Tex. There they are deprimed and sold to smelters for an average profit of 15¢ per lb. Money is credited to the Ordnance Dept.

In the past 3 months Red River has received about 12,000 tons of empty shells. Average estimated cost of returning the brass, including rail freight and depriming, is 5¢ per lb. It is sold to mills on NPA allocation for 20¢ per lb. Profits so far have been $3.6 million.

Depriming—Cost of depriming, while not a major factor, is an expense that cannot be eliminated. Fired primers differ in composition from shell cases; smelting together would result in an alloy unsuitable for making new rounds. Removal is also a safety precaution against live primers going into the smelter.

Shells are placed in a rotating fixture, which indexes automatically. A special machine punches out two primers at one pass, 30 shells per min. (above). Brass is then carried by conveyer directly into freight cars for shipment to smelters.

Steel Too — About 2.5 million steel packing containers have also been returned in the last 90 days. After sorting, these are shipped to loading plants as needed. Containers cost from $7.50 each up. With reclamation costing $1.25 to $1.50 per container, salvage saves a minimum of $6 apiece.

Reclamation of shell cases and containers has long been standard procedure at U. S. military installations, but Ordnance needed a special act of Congress to pay for overseas recovery.

Even more important than the financial savings is the conservation of critical materials. Average receipts per month at Red River for the last 3 months have been 8 million lb of brass and 833,000 containers.

ALUMINUM: Planners Suffer Setback

DPA reverses idea overnight . . . 4 million-ton stockpile so "ridiculous" it wasn't discussed . . . May yet close Canada deal . . . Small fabricators cry for metal—*By R. L. Hatschek.*

Government defense planners made one of their swiftest reversals last week. It was the case of an additional 150,000-ton aluminum expansion in the U. S., a 4 million-ton stockpile of the light metal by 1963, and a substantial purchasing agreement with Aluminum Co. of Canada (See p. 73 for Washington view).

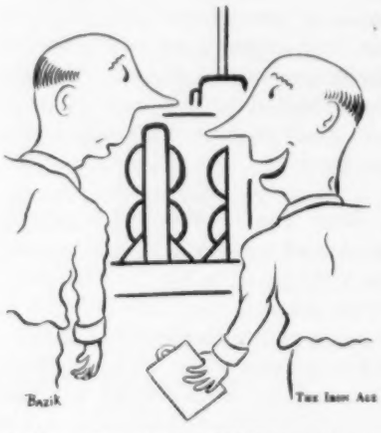
Aluminum producers were unanimous in agreement that they were not shown a single valid reason for such a plan. They felt that government figures on "probable" aluminum requirements at the end of the decade were based on quicksand.

What Washington had done was to take a per-capita-consumption curve dating back to 1950—a definitely abnormal period—and extrapolate it through to 1960. This they felt to be an accurate enough yardstick for a metal which has never yet had a true test of civilian demand under normal circumstances. Aluminum has literally done its growing since 1939 and many uses and techniques since developed were undreamed of then. Producers have extreme confidence in being able to sell their expanded production but they also know that they will have to *sell* it.

Apology to Copper—It seemed to some sources that the "third round" of expansion was a crumb the government was throwing to copper producers in apology for plugging the light metal as a copper substitute. This feeling was based on the second meeting on the subject from which the four aluminum producers were excluded but certain copper producers attended.

The reversal came on the expansion question. The basis was just too shaky and the proposal was dropped. Short of an all-out war, 1.5 million tons of aluminum a year plus secondary recovery and normal imports should cover demand until 1960, the planners decided.

In the eyes of the producers the proposed 4-million-ton stockpile was "so fanastic that it shouldn't even be considered" and it appears that Defense Production Agency (which isn't the stockpiling agency) just dropped it. But industry feels the subject will be brought up again, perhaps for a fourth of the originally proposed quantity.



"We're rolling that 0.000001-in. foil now. You didn't expect to be able to see it did you?"

The Canadian deal under consideration would make available 300,000 tons of aluminum per year to U. S. consumers with Washington guaranteeing to purchase up to 60 pct (180,000 tons per year) if domestic demand dropped off to such an extent that private sales didn't reach the 300,000 tons. This arrangement would run from 1955 through 1959.

Oppose Commitment—Domestic producers were quick to point out that we need the metal now and that this flow wouldn't start until 1955. They were disturbed at having the whole plan thrown at them without any previous consultation. Producers are definitely opposed to making a firm commitment for foreign aluminum on a mere guess at what total civilian demand may be in the future.

Estimates of military requirements were to be shown at these meetings but that report wasn't ready and is not expected to be ready for another 2 weeks.

Further meetings had been scheduled with independent aluminum fabricators but their status is not known at present. It seems likely that such meetings will be held since the Canadian offer still stands. Many of these smaller companies favor such a deal.

Need Metal—The Senate Small Business Committee also held hearings last week on the subject of aluminum for small fabricators. These people want and need metal to keep in business and they don't know why they can't have CMP tickets for available metal.

A spokesman for Reynolds Metals Co. called for a relaxation of government controls on aluminum and pointed out that "civilian fabricators are entitled to all the aluminum not needed by the military." He further stated that producers should be able to get into new market development as soon as defense is satisfied.

Pipe Firm to Enlarge Facilities

McWane Cast Iron Pipe Co., Birmingham, Ala., has been given permission by National Production Authority to expand its present facilities by constructing a new $3 million pipe-production unit. The new unit will more than double the plant's capacity to turn out 2-in. and 2¼-in. cast iron pipe, and will increase its employment by nearly 300.

The company did not ask for any tax amortization or certificate of necessity for the expansion. It has all the critical materials needed for construction, but did need an NPA priority for machinery.

The company will use the centrifugal force casting method.

TRADE: Export-Import Gap Widens

Imports $4 billion below exports . . . Up 185 pct over 1950 . . . Shipments both ways at record highs, but imports off since April . . . Some bright spots — *By G. G. Carr.*

The gap between U. S. imports and exports widened in 1951. Exports exceeded imports by $4 billion, a 185 pct increase over the 1950 difference of $1.4 billion.

Both outgoing and incoming shipments reached record highs; exports, $15 billion, imports, $11 billion. Imports, however, started a downward trend in April 1951 which is still continuing.

Price rises partially accounted for the record figures, but of major significance were: (1) Heavy demands of the U. S. defense program for raw materials and semimanufactures; (2) our commitments under Mutual Security and NATO agreements; (3) continued growth of foreign industrial and agricultural productivity; and (4) a substantial rise in the U. S. consumer income.

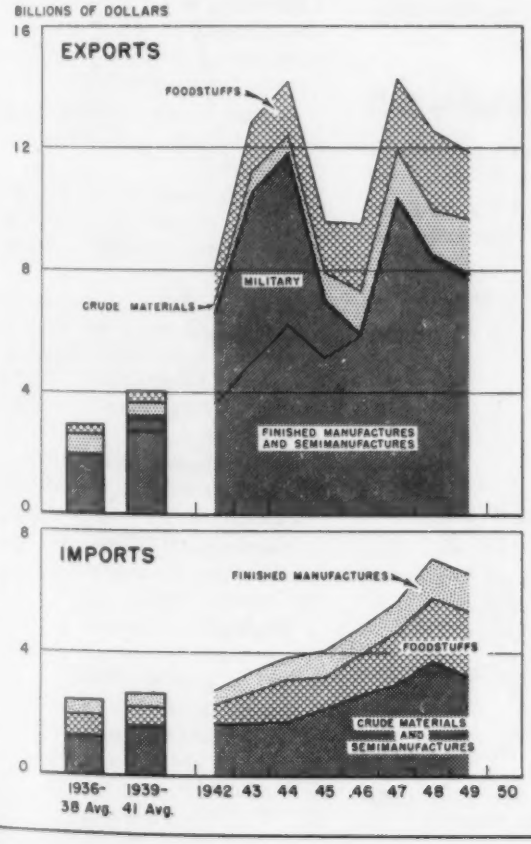
They're Off—Decreases in imports of iron and steel mill products account for part of the general import decline. Other major import items showing marked drops included agricultural machinery, petroleum, fertilizers, wool, coffee, cocoa and inedible vegetable oils.

Concrete reasons for the import decline are hard to find. There was a definite slackening of imports of some strategic materials, especially metals, for defense stockpiles. Price boosts abroad undoubtedly slowed American buyers, already handicapped by price controls at home. There is a good possibility that a rising standard of living, especially in Europe, increased home consumption, leaving less for export. And deteriorating East-West relations of course hurt trade.

Looking Up—It's too early to tell for sure, but the gap seems to be narrowing. Metal imports are on the upgrade, and foreign machine tools are winning a spot on the American production line because of extended delivery time for domestic machines. Most important, foreign companies are learning better and better how to tailor their products to the U. S. market.

But it will take a lot of selling to close the export-import gap. This imbalance first appeared about 1910 as a tiny crevice. It kept on widening, especially since 1939.

Foreign competition can be a real headache, but no customers is worse. And as the old merchant's adage has it, "People who aren't selling can't buy."



FOREIGN TRADE: Dept. of Commerce analysis of U. S. exports and imports by economic classes for 1936-49, left. Above, ratio of American exports against imports, 1947-50.

COPPER: More Scrap for Industry

Washington expects boost in flow of copper scrap to industry . . . OPS puts ceilings on dealer-to-dealer sales . . . Can pay top premium of 1¾¢ per lb on dealer scrap sales.

Greater flow of copper and copper alloy scrap to industrial users is predicted by government pricers, who have amended Ceiling Price Reg. 46 to set ceilings on dealer-to-dealer transactions in this material.

In Amendment 2 to CPR 46, effective Mar. 12, pricers discarded a previously-held theory that activities solely involving dealers would not affect price of scrap to the user. Ceilings on dealer-to-dealer operations now are identical to top prices applying to other transactions.

Amdt. 2 allows payment of a maximum premium of 1¾¢ per lb on dealer scrap sales. Smaller dealers thus are enabled to buy at the maximum premium named and then take advantage of the quantity premium.

Other Provisions — The same amendment provides that:

1. Sellers of unique scrap alloys not listed in CPR 46 may ask Office of Price Stabilization for correct ceilings.

2. Sellers without a foundry may sell new railroad bearings at a lower net price to meet competition of sellers owning foundries. This action is made possible by an exemption for sales and deliveries of used railroad bearings for conversion into new bearings.

3. A copper refiner or a brass or bronze ingot manufacturer may pay a preparation fee for scrap he does not use in refining copper or producing ingots. Payment will be determined on the basis of product to be made from the scrap. Previously, only a buyer who did not produce refined copper or brass or bronze ingots could pay this fee.

Unchanged — Export quotas for refined copper, for copper, brass and bronze scrap, and for copper base alloy ingots will remain the same for the second quarter as for the first.

As announced by the U. S. Office of International Trade, the new quotas are: 12,000 short tons for refined forms; 3000 tons for scrap, except Schedule B, Nos. 641300 and 641200; and 650 tons for copper-base alloy ingots.

More Cars, Trucks, Freight Cars

Following a decision arrived at earlier in the week, Defense Production Administration on last Friday issued new second quarter quotas for manufacture of transportation equipment—automobiles, trucks, freight cars, and locomotives.

New authorized production levels are: Passenger cars, 1,050,000 units; commercial trucks, 250,000 vehicles (see p. 79); freight cars, 22,000 units, up by 4000 units; and, locomotives, 750 units, up 50 units.

MRO Tool Parts Returned to M-79

Replacement parts for machine tools, removed from NPA Order M-79 in November at the request of the industry, now have been put back in the order.

This provision assures priority aid in obtaining certain MRO supplies for export.

A change in the order permits an optional change of base periods in computing MRO quotas—the alternative being last-half 1951.

Includes Wheels—In addition, a revision has been made in Section 2 (b) to include grinding wheels. Also added are pole lines, transmission and distribution hardware, and electrical porcelain, not technically replacement parts but nevertheless essential.

Definitions of hand tools are rewritten to make clear that power-driven hand tools are included, but industrial belting and hosing have been removed.

A new section has been added to the order which permits a manufacturer to come under the order on application, even though 1950 sales of MRO for export were below the $10,000 floor set forth in the original order.

"Let the secret leak out that I'm irritable today—I don't want to be disturbed."

Industry Controls This Week

Construction—CMP Reg. 6, revised, liberalizes use of steel, copper and aluminum. Direction 1, CMP Reg. 6, M-4A revoked. Amend. Direction 4, CMP Reg. 6 covers water well construction schedules. M-100 relaxes restrictions on steel but tightens up on copper for housing.

Copper Scrap—Amend. 2, CPR 46 sets ceilings on dealer-to-dealer transactions.

Iron & Steel—Amend. 1, CPR 98 changes pricing on resale of pipe, boiler tubes, imported and new products.

Machine Tools—Inventory reports on used and imported units now required by M-101. MRO parts returned to M-79. Direction 5, CMP Reg. 6 covers DO ratings on machine tool acquisition.

Rails—Amend. 29, GCPR clarifies regulations on sales of used rails, etc., as scrap.

Selenium—Deliveries on purchaser's certification of authorization allowed by Amend., M-91.

Tinplate—Three new grades of off-grade tinplate and terneplate established by Amend., M-24.

Tungsten—M-81 removes necessity of allocations for sales to laboratories of reagent chemicals containing under 5 lb of tungsten.

Turn Page

STEEL: West Leads Capacity Race

Openhearth capacity 3,662,930 tons higher, electrics up 662,060 tons, Bessemer off 240,000 tons . . . West and Detroit built 90 pct of new electrics . . . South Ohio River drops.

The steel industry showed a net capacity gain of 4,084,990 tons during 1951, 3.91 pct over the previous year. The West Coast led the way in this increase by constructing 18.66 pct of the new facilities. The next four areas were Philadelphia with 13.00 pct, Cleveland with 12.80 pct, Chicago with 11.96 pct, and Detroit with 8.82 pct. The biggest district of all, Pittsburgh, gained 8.80 pct of the total for the nation. The only area to register a drop in capacity was the South Ohio River district, where capacity went down 71,200 tons.

This new compilation of steel capacity by IRON AGE districts is based on detailed official capacity by plants as of Jan. 1, 1952, just revealed by American Iron & Steel Institute.

In the national shuffle, Pittsburgh's share dipped 0.48 pct to 20.96 pct of total U. S. capacity. Others that dropped were Chicago, Youngstown and South Ohio River, while the Southern district showed no change in percent of the national total. All others increased. Here again the West scored the highest gain by going up 0.45 pct to 7.03 pct of the total.

Big Electric Gain—Openhearth capacity jumped 4.01 pct and electric furnace totals soared 8.74 pct over 1951 figures, while bessemer steelmaking facilities dropped 4.27 pct, all in Pittsburgh. Absolute figures were: Openhearth, up 3,662,930 tons; electric furnace (plus crucible), up 662,060 tons; and bessemer, down 240,000 tons.

New breakdown of steelmaking facilities by type is: Openhearth, 87.46 pct; electric and crucible, 7.58 pct; and bessemer, 4.96 pct.

The West Coast accounted for 59.56 pct of the electric furnace gain by erecting 394,300 tons of capacity of this type. Detroit is also interested in electrics and added 197,020 tons to electric furnace capacity (29.76 pct of the net electric furnace gain). Electric furnace capacity went down in Chicago and Youngstown only.

The current year will see new capacity coming into use even faster than 1951. New facilities are being completed at the rate of nearly a million tons per month and total capacity at the end of the year will probably be about 118 million tons.

Largest steel mill ever built at a single stroke is U. S. Steel Co.'s Fairless Works at Morrisville, Pa. When completed, this project will be capable of turning out 1.8 million tons of steel a year. Rolling operations are scheduled to start this summer with hot bands sent from Pittsburgh.

This operation coupled with the huge expansion slated for Bethlehem Steel Co.'s Sparrows Point mill will push THE IRON AGE Philadelphia district up into third position ahead of Youngstown. Bethlehem's ambitious program will make Sparrows Point the second largest mill in the world, rivaling U. S. Steel's Gary Works.

Pig Capacity — Latest total potential of the nation's blast furnaces is 72,709,940 tons of pig iron annually and the ferroalloy total has reached 1,081,400 tons per year, making a total for the two of 73,782,340 tons from the 251 blast furnaces throughout the U. S.

Total coke capacity as of Jan. 1, 1952, is 67,060,240 tons, of which 3,861,750 tons is beehive.

IRON AGE DISTRICT CHANGES AT A GLANCE

IRON AGE District	Pct of Total Capacity	Change in Pct Total Capacity	Change in Tonnage Capacity	Change in Pct of District Capacity: Total	Openhearth	Bessemer	Electric & Crucible	Pct of Total U. S. Change
Pittsburgh	20.96	−0.48	359,450	1.60	2.28	−16.60	11.47	8.80
Chicago	18.65	−0.26	488,590	2.47	3.20	0.00	−6.12	11.96
Youngstown	12.42	−0.18	323,560	2.46	4.48	0.00	−5.98	7.92
Philadelphia	12.42	0.02	531,290	4.10	3.95	0.00	9.63	13.00
West	7.03	0.45	762,300	11.09	5.96	.....	56.66	18.66
Buffalo	5.03	0.05	261,000	5.02	5.10	.....	0.00	6.39
Cleveland	4.93	0.31	523,000	10.82	13.30	0.00	.....	12.80
Detroit	4.72	0.16	360,440	7.56	4.42	.....	18.36	8.82
Wheeling	4.14	0.04	214,880	5.02	5.57	0.00	.....	5.26
South	3.81	0.00	151,000	3.79	3.91	.....	0.00	3.70
South Ohio River	3.43	−0.20	−71,200	−1.88	−3.44	.....	8.01	−1.74
St. Louis	1.85	0.07	147,160	7.90	7.90	.....	.....	3.60
East	0.60	0.01	33,520	5.45	4.71	.....	10.21	0.82
Total	100.00	.....	4,084,990	3.91	4.01	−4.27	8.74	.....

Source: The Am

Ingot Capacity by Distr

DISTRICT — COMPANY	Rated Annual Capaci 1952	1951	1948
Pittsburgh			
Allegheny Ludlum Steel Corp.	746,700	786,860	430,8
American Locomotive Co.	103,000	103,000	103,0
American Steel & Wire Div.	900,000	900,000	842,0
Armco Steel Corp.	474,000	474,000	432,0
Babcock & Wilcox Tube Co.	133,450	64,800	50,4
Bethlehem Steel Co.	2,100,000	2,028,000	1,900,0
Braeburn Alloy Steel Corp.	20,730	20,730	20,7
Byers, A. M. Co.	75,000	75,000	150,0
Colonial Steel Co.	7,020	7,020	7,0
Crucible Steel Co.			
La Belle	.....	.....	.....
Midland	1,137,000	1,095,000	997,5
Park	.....	.....	183,1
Total	1,137,000	1,095,000	1,181,0
Edgewater Steel Co.	89,890	146,470	140,1
Firth Sterling Steel & Carbide Corp.	20,040	20,040	20,0
Heppenstall Steel Co.	55,550	42,880	46,5
Jessop Steel Co.	33,490	41,560	50,0
Jones & Laughlin Steel Corp.			
Aliquippa	1,764,000	1 764 000	1 764,0
Pittsburgh	2,580,000	2 137 500	2 137,5
Total	4,344,000	3 901 500	3 901,5
Latrobe Electric Steel Co.	25,200	12,000	12,0
Mesta Machine Co.	105,000	105,000	105,0
National Tube Div.	1,224,000	1,164,000	1,164,0
Pittsburgh Steel Co.	1,072,000	1,072,000	1,072,0
Union Electric Steel Corp.	26,760	26,760	21,4
Universal-Cyclops Steel Corp.	70,160	54,120	54,0
United States Steel Co.			
Clairton	900,000	870,000	805,0
Duquesne	2,060,000	1,942,800	1,742,0
Edgar Thompson	2,080,400	2,080,400	1,753,0
Homestead	4,366,000	4,866,000	4,279,0
Johnstown	24,400	24,400	24,0
Vandergrift	550,000	480,000	500,0
Total	9,980,800	10,263,600	9,104,0
Vanadium-Alloys Steel Co.	11,910	11,910	11,9
Vulcan Crucible Steel Co.	9,600	9,600	9,6
TOTAL Pittsburgh District	22,765,300	22,405,850	20,829,3
Chicago			
American Locomotive Co.	78,000	78,000	78,0
American Steel & Wire Div.	918,000	918,000	690,0
Borg-Warner Corp.	30,000	28,350	28,3
Columbia Tool Steel Co.	6,600	6,600	6,6
Continental Steel Corp.	394,000	393,760	360,0
Inland Steel Co.	3,750,000	3,750,000	3,400,0
International Harvester Co.	900,000	900,000	900,0
Joslyn Mfg. & Supply Co.	37,500	37,500	37,5
Northwestern Steel & Wire Co.	321,000	321,000	321,0
Reconstruction Finance Corp.			
South Chicago	.....	.....	.....
East Chicago	.....	.....	120,0
Total	.....	.....	120,0
Republic Steel Corp.	1,132,000	1,100,000	1,250,0
United States Steel Co.			
Gary	6,264,400	6,025,700	5,710,0
South Works	4,891,000	4,675,000	4,590,0
Total	11,155,400	10,700,700	10,300,0
Youngstown Sheet & Tube Co.	1,526,000	1,526,000	1,400,0
TOTAL Chicago District	20,248,500	19,759,910	18,800,0

cial Steel Industry Capacitie

Source: The American Iron & Steel Institute — Compilations: The Iron Age

Ingot Capacity by Districts

DISTRICT—COMPANY	Rated Annual Capacity—Net Tons				
	1952	1951	1948	1945	1936
Pittsburgh					
Allegheny Ludlum Steel Corp.	746,700	766,860	430,860	394,860	523,040
American Locomotive Co.	103,000	103,000	103,000	103,000	103,040
American Steel & Wire Div.	900,000	900,000	842,000	842,000	702,240
Armco Steel Corp.	474,000	474,000	432,000	591,000	549,600
Babcock & Wilcox Tube Co.	133,450	64,800	50,400	50,400	.....
Bethlehem Steel Co.	2,100,000	2,028,000	1,900,000	1,900,000	1,367,800
Braeburn Alloy Steel Corp.	20,730	20,730	20,730	20,730	5,645
Byers, A. M. Co.	75,000	75,000	150,000	150,000	.....
Colonial Steel Co.	7,020	7,020	7,020	7,020	58,240
Crucible Steel Co.					
La Belle	.....	.....	.....	3,780	23,330
Midland	1,137,000	1,095,000	997,950	1,034,400	672,000
Park	.....	.....	183,100	181,500	134,400
Total	1,137,000	1,095,000	1,181,050	1,219,680	829,730
Edgewater Steel Co.	89,890	146,470	140,170	140,170	84,000
Firth Sterling Steel & Carbide Corp.	20,040	20,040	20,040	17,540	16,222
Heppenstall Steel Co.	55,550	42,880	46,580	42,560	42,560
Jessop Steel Co.	33,490	41,560	50,000	50 000	17 920
Jones & Laughlin Steel Corp.					
Aliquippa	1,764,000	1 764 000	1 764,000	1 764,000	1 622 880
Pittsburgh	2,580,000	2 137 500	2 137,500	2 233,500	2 476 320
Total	4,344,000	3 901 500	3 901,500	3 997,500	4,099,200
Latrobe Electric Steel Co.	25,200	12,000	12,000	12,000	13,440
Mesta Machine Co.	105,000	105,000	105,000	105,000	72,800
National Tube Div.	1,224,000	1,164,000	1,164,000	1,200,000	1,077,440
Pittsburgh Steel Co.	1,072,000	1,072,000	1,072,000	1,072,000	806,400
Union Electric Steel Corp.	26,760	26,760	21,000	25,200	10,080
Universal-Cyclops Steel Corp.	70,160	54,120	54,120	54,120	33,600
United States Steel Co.					
Clairton	900,000	870,000	805,000	805,000	504,000
Duquesne	2,060,000	1,942,800	1,742,800	2,146,800	1,904,000
Edgar Thompson	2,080,400	2,080,400	1,753,000	2,297,000	1,680,000
Homestead	4,366,000	4,866,000	4,279,000	4,732,000	3,136,000
Johnstown	24,400	24,400	24,400	24,400	.....
Vandergrift	550,000	480,000	500,000	500,000	380,800
Total	9,980,800	10,263,600	9,104,200	10,552,200	7,604,800
Vanadium-Alloys Steel Co.	11,910	11,910	11,910	11,910	5,600
Vulcan Crucible Steel Co.	9,600	9,600	9,600	9,600	4,237
TOTAL Pittsburgh District	22,765,300	22,405,850	20,829,180	22,521,400	18,554,443

DISTRICT—COMPANY	Rated Annual Capacity—Net Tons				
	1952	1951	1948	1945	1936
Chicago					
American Locomotive Co.	78,000	78,000	78,000	78,000	78,400
American Steel & Wire Div.	918,000	918,000	690,000	610,400	336,000
Borg-Warner Corp.	30,000	28,350	24,000	24,000	14,757
Columbia Tool Steel Co.	6,600	6,600	6,600	6,600	4,480
Continental Steel Corp.	394,000	393,760	364,000	364,000	313,600
Inland Steel Co.	3,750,000	3,750,000	3,400,000	3,400,000	2,620,800
International Harvester Co.	900,000	900,000	900,000	900,000	769,104
Joslyn Mfg. & Supply Co.	37,500	37,500	37,500	37,500	.....
Northwestern Steel & Wire Co.	321,000	321,000	321,000	321,000	33,600
Reconstruction Finance Corp.					
South Chicago	.....	.....	.....	80,000	.....
East Chicago	.....	.....	120,000	120,000	.....
Total	.....	.....	120,000	200,000	.....
Republic Steel Corp.	1,132,000	1,100,000	1,225,000	1,301,000	456,960
United States Steel Co.					
Gary	6,264,400	6,025,700	5,718,800	5,718,800	5,855,360
South Works	4,891,000	4,675,000	4,525,000	4,525,000	4,874,240
Total	11,155,400	10,700,700	10,243,800	10,243,800	10,729,600
Youngstown Sheet & Tube Co.	1,526,000	1,526,000	1,446,000	1,446,000	1,064,000
TOTAL Chicago District	20,248,500	19,759,910	18,855,900	18,932,300	16,421,301

DISTRICT—COMPANY	Rated Annual Capacity—Net Tons				
	1952	1951	1948	1945	1936
Valley (Youngstown)					
Copperweld Steel Co.	618,380	554,400	450,000	321,360	.....
Damascus Tube Co.	1,800	1,800	.....	.....	.....
Empire Steel Co.	409,300	390,320	369,730	348,540	343,296
Industrial Forge & Steel Inc.	48,600	48,600	50,000	50,000	11,290
Reconstruction Finance Corp.	.....	360,000*	360,000*	.....	.....
Republic Steel Corp.					
Canton	1,125,000	975,000	775,000	1,445,000	1,179,360
Massillon	620,000	610,000	610,000	610,000	585,760
Warren	900,000	900,000	860,000	950,000	734,720
Youngstown	2,142,000	2,130,000	2,150,000	2,350,000	1,705,760
Total	4,787,000	4,615,000	3,395,000	5,355,000	4,205,600
Sharon Steel Co.					
Farrell	1,000,000	981,400	1,000,000	1,050,000	896,000
Lowellville	550,000	460,000	572,000	636,000	504,000
Timken Roller Bearing Co.	547,200	547,200	547,200	547,200	336,000
United States Steel Co.					
Youngstown	2,684,000	2,484,000	2,344,000	2,344,000	2,060,800
Youngstown Sheet & Tube Co.					
Brier Hill	1,182,000	1,182,000	1,104,000	1,104,000	940,800
Campbell	1,662,000	1,542,000	1,452,000	1,452,000	1,489,600
Total	2,844,000	2,724,000	2,556,000	2,556,000	2,430,400
TOTAL Valley District	13,490,280	13,166,720	12,643,930	13,208,100	10,787,388

* Idle capacity formerly reported with Repulic at Canton.

DISTRICT—COMPANY	Rated Annual Capacity—Net Tons				
	1952	1951	1948	1945	1936
Philadelphia					
Alan Wood Steel Co.	625,000	550,000	550,000	550,000	739,200
American Bridge Div.	.....	.....	.....	.....	268,800
Armco Steel Corp. (Rustless Iron & Steel Div.)	102,000	102,000	95,000	114,000	21,132
Baldwin-Lima-Hamilton Corp.	169,960	149,300	149,300	169,930	123,984
Bethlehem Steel Co.					
Bethlehem	3,128,000	3,080,000	2,585,000	2,503,000	2,013,760
Sparrows Point	5,400,000	5,160,000	4,651,000	4,075,000	2,813,664
Steelton	1,312,000	1,032,000	886,000	740,000	709,632
Total	9,840,000	9,272,000	8,122,000	7,318,000	5,537,056
Boiardi Steel Corp.	53,700	50,760	.....	.....	.....
Carpenter Steel Co.	85,800	81,360	74,880	74,880	43,904
Central Iron & Steel Co.	406,000	406,000	288,000	336,000	336,000
Claymont Steel Corp.	468,000	468,000	460,000	460,000	423,360
Henry Disston & Sons, Inc.	25,000	25,000	25,000	25,000	13,440
Eastern Stainless Steel Co.	14,400	12,000	.....	.....	.....
Harrisburg Steel Corp.	100,750	100,750	100,750	100,750	86,800
Lukens Steel Co.	675,000	675,000	624,000	624,000	844,480
Midvale Co.	274,650	417,370	523,770	519,370	300,187
Newport News Shipbldg. & Drydock Co.	12,000	12,000	7,500	7,500	2,464
Old Dominion Iron & Steel Works	.....	.....	.....	.....	2,900
Phoenix Iron & Steel Co.	432,000	431,430	231,400	231,400	231,616
J. A. Roebling's Sons Co.	204,870	204,870	253,000	253,000	212,800
U. S. Naval Gun Factory	.....	.....	.....	.....	2,016
TOTAL Philadelphia District	13,489,130	12,957,840	11,504,600	10,783,830	9,190,039

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DISTRICT—C

Western

Bethlehem Paci
Co.
Los Angeles
San Francisco
Seattle
Total
Colorado Fuel &
Columbia-Gene
Geneva
Pittsburg
Torrance
Total
Isaacson Iron W
Judson Steel Co
Kaiser Steel Co
National Supply
Northwest Stee
Oregon Steel M
Pacific States S
Seidelhuber St
Co.
Sheffield Steel
Sands Spring
Houston
Total
Southwest Stee
Texas Steel Co
TOTAL Wes

Buffalo

Allegheny Ludl
Dunkirk
Tonawanda
Total
Bethlehem Ste
Erie Forge Co.
Erie Forge & S
National Forge
Republic Steel
Simonds Saw
Colorado Fuel
TOTAL Buf

Clevelan

Jones & Laugh
National Tube
Republic Stee
TOTAL Cle

Detroit

Allegheny Lu
Ford Motor C
Great Lakes
McLouth Ste
Rotary Electr
TOTAL De

cities

DISTRICT—COMPANY	Rated Annual Capacity—Net Tons				
	1952	1951	1948	1945	1936
Western					
Bethlehem Pacific Coast Steel Co.					
Los Angeles	384,000	324,000	213,000	117,000	95,200
San Francisco	240,000	240,000	235,000	235,000	173,600
Seattle	216,000	216,000	210,000	210,000	156,800
Total	840,000	780,000	658,000	562,000	425,600
Colorado Fuel & Iron Co.	1,320,000	1,320,000	1,272,000	1,272,000	991,245
Columbia-Geneva Steel Div.					
Geneva	1,600,000	1,440,000	1,283,400	1,283,400	.....
Pittsburg	364,700	364,700	362,600	416,600	263,648
Torrance	213,700	213,700	208,200	211,000	196,000
Total	2,178,400	2,018,400	1,854,200	1,911,000	459,648
Isaacson Iron Works	102,000	101,520	104,400	104,400	.....
Judson Steel Co.	76,500	76,500	76,500	76,500	71,971
Kaiser Steel Corp, Inc.	1,380,000	1,200,000	870,000	750,000	.....
National Supply Co.	63,000	50,400	41,400	45,900	8,400
Northwest Steel Rolling Mills	32,400	32,400	32,400	32,400	16,800
Oregon Steel Mills	110,000	110,000	66,100	60,000	.....
Pacific States Steel Corp.	232,000	231,300	94,500	88,820	.....
Seidelhuber Steel Rolling Mill Co.	49,300	.....	.....	.....	.....
Sheffield Steel Corp. (Armco)					
Sands Springs	54,000	54,000	54,000	54,000	56,000
Houston	1,050,000	840,000	560,000	466,000	.....
Total	1,104,000	894,000	614,000	520,000	56,000
Southwest Steel Rolling Mills	36,000	36,000	.....	.....	.....
Texas Steel Corp.	22,320	22,320	22,320	22,320	4,256
TOTAL Western District	7,635,140	6,872,840	5,705,820	5,466,790	2,033,920
Buffalo					
Allegheny Ludlum Steel Co.					
Dunkirk	33,000	33,000	33,000	33,000	16,800
Tonawanda	4,500	4,500	4,500	4,500	.....
Total	37,500	37,500	37,500	37,500	16,800
Bethlehem Steel Corp.	4,020 000	3,920,000	3,120,000	3,120,000	2,649,025
Erie Forge Co.	234,000	85,000	80,000	80,000	22,960
Erie Forge & Steel Co.	.....	.....	126,950	126,950	76,875
National Forge & Ordnance Co.	25,000	25,000	25,000	25,000	11,200
Republic Steel Corp.	882,000	870,000	830,000	850,000	633,920
Simonds Saw & Steel Co.	21,600	21,600	21,600	21,600	11,200
Colorado Fuel & Iron Corp.	240,000	240,000	180,000	180,000	168,000
TOTAL Buffalo District	5,460,100	5,199,100	4,423,050	4,448,575	3 589,980
Cleveland					
Jones & Laughlin Steel Corp.	1,155,000	945,000	840,000	1,026,900	843,360
National Tube Div.	2,300,000	2,250,000	1,884,000	1,944,000	1 747,200
Republic Steel Corp.	1,900,000	1,637,000	1,500,000	1,570,000	1,480,640
TOTAL Cleveland District	5,355,000	4,832,000	4,224,000	4,540,900	4,071,200
Detroit					
Allegheny Ludlum Co.	3,000	3,000	3,000	3,000	.....
Ford Motor Co.	1,521,280	1,471,940	1,115,100	967,420	604,800
Great Lakes Steel Corp.	2,600,000	2,450,000	2,100,000	2,050,000	1,545,600
McLouth Steel Corp.	581,100	420,000	.....	.....	.....
Rotary Electric Steel Corp.	425,000	425,000	255,000	170,000	84,000
TOTAL Detroit District	5,130,380	4,769,940	3,473,100	3,190,420	2,234,400

DISTRICT—COMPANY	Rated Annual Capacity—Net Tons				
	1952	1951	1948	1945	1936
Wheeling					
Carnegie-Illinois Steel Corp.	.....	.....	.....	.....	672,000
Follansbee	.....	.....	.....	.....	100.800
Ohio River Steel Div.	136 080	121,200	136,080	126,000	123,200
National Steel Corp.					
Weirton Steel Co.	2,500,000	2,300,000	1,950,000	1,850,000	1,478,400
Wheeling Steel Corp.					
Benwood	420,000	420,000	336,000	336,000	280,000
Steubenville	1,440,000	1,440,000	1,073,000	1,008,000	1,008,000
Total	1,860,000	1,860,000	1,409,000	1,344,000	1,288,000
TOTAL Wheeling District	4,496,080	4,281,200	3,495,080	3,320,000	3,662,400
Southern					
Atlantic Steel Co.	188,000	188,000	165,000	154,000	153,485
Case Co., J. I.	.....	.....	74,400	74,400	16,800
Connors Steel Co.	60,000	60,000	60,000	60 000	.....
Kilby Steel Co.	34,020	34 020	.....	.....	.....
Knoxville Iron Co.	38,000	38,000	38,000	38,000	.....
Republic Steel Co.	789,000	745,000	650,000	715,000	448,000
Tennessee Coal, Iron & R. R. Co.					
Ensley	1,625.000	1,568,000	1,568,000	1,568,000	1,075,200
Fairfield	1,402,000	1,352,000	1,282,000	1,092,000	922,880
Total	3,027,000	2,920,000	2,850,000	2,660,000	1,998,080
TOTAL Southern District	4,136,020	3,985,020	3,837,400	3,701,400	2,616,365
South Ohio River					
Armco Steel Corp.					
Ashland	860,000	900,000	828,000	783,000	619,808
Middletown	1,505,000	1,540,000	972,000	948,000	815,360
Total	2,365,000	2,440,000	1,800,000	1,731,000	1,435,168
Detroit Steel Corp.	650,000	650,000	720,000	616,000	560,000
Newport Steel Corp.	708,500	704,700	413,100	413,100	384,160
TOTAL South Ohio District	3,723,500	3,794,700	2,933,100	2,760,100	2,379,328
St. Louis					
Armco Steel Corp.					
Scullin	.....	.....	.....	.....	228,614
Granite City Steel Co.	720,000	720,000	620,000	703,200	403,200
Keystone Steel & Wire Co.	400,000	325,000	302,400	302,400	264,580
Laclede Steel Co.	410,000	397,840	326,020	326,020	278,840
Sheffield Steel Corp.	480,000	420,000	426,000	426,000	260,288
TOTAL St. Louis District	2,010,000	1,862,840	1,674,420	1,757,620	1,435,522
Eastern					
Allegheny Ludlum Steel Co.	30,000	25,000	25,000	25,000	25,760
American Steel & Wire Div.	275,000	250,000	250,000	280,000	212,800
Crucible Steel Co. of America					
Harrison	2,360	2,160	4,800	210,000	34,384
Syracuse	59,600	56,280	67,800	24,000	16,800
Halcomb	.....	.....	.....	54,000	49,168
Total	61,960	58,440	72,600	288,000	100,352
Stanley Works	188,280	188,280	188,280	188,280	134,400
Washburn Wire Co.	93,000	93,000	60,000	60,000	57,120
Wickwire Brothers, Inc.	.....	.....	38,000	38,000	47,040
TOTAL Eastern District	648,240	614,720	633,880	879,280	577,472

THE IRON AGE DISTRICTS STEEL CAPACITY

In Thousands of Net Tons—*Source: American Iron & Steel Institute—Compilations: The Iron Age*

District	1952		1951		1948		1945		1936	
	Net Tons	Pct of Total	Net Tons	Pct of Total	Net Tons	Pct of Total	Net Tons	Pct of Total	Net Tons	Pct of Total
Pittsburgh	22,765	20.96	22,406	21.44	20,829	22.10	22,521	23.58	18,555	23.83
Chicago	20,249	18.65	19,760	18.91	18,856	20.01	18,932	19.82	16,421	21.09
Youngstown	13,490	12.42	13,167	12.60	12,644	13.42	13,208	13.83	10,787	13.86
Philadelphia	13,489	12.42	12,958	12.40	11,505	12.21	10,784	11.29	9,190	11.80
Western	7,635	7.03	6,878	6.58	5,706	6.06	5,467	5.72	2,034	2.61
Buffalo	5,460	5.03	5,200	4.98	4,423	4.69	4,443	4.65	3,890	5.00
Cleveland	5,355	4.93	4,832	4.62	4,224	4.48	4,541	4.75	4,071	5.23
Detroit	5,130	4.72	4,770	4.56	3,473	3.69	3,190	3.34	2,234	2.87
Wheeling	4,496	4.14	4,281	4.10	3,495	3.71	3,320	3.48	3,662	4.70
Southern	4,136	3.81	3,985	3.81	3,837	4.07	3,701	3.88	2,616	3.36
South Ohio River	3,724	3.43	3,795	3.63	2,933	3.11	2,760	2.89	2,379	3.06
St. Louis	2,010	1.85	1,863	1.78	1,674	1.78	1,758	1.84	1,436	1.84
Eastern	648	0.60	615	0.59	634	0.67	879	0.92	577	0.74
Total	108,588	100.00	104,503	100.00	94,233	100.00	95,503	100.00	77,852	100.00

	PIG IRON		FERROALLOYS		Total annual capacity (N. T.)
	No. of stacks	Annual capacity (N. T.)	No. of stacks	Annual capacity (N. T.)	
Companies:					
Alan Wood Steel Company	2	454,800	...	.....	454,800
Allegheny Ludlum Steel Corporation	*1	*96,000	...	.....	*96,000
Armco Steel Corporation	5	1,341,000	...	.....	1,341,000
Sheffield Steel Corporation	1	300,000	...	.....	300,000
Valencia Iron & Chem. Corp.	1	27,000	...	.....	27,000
TOTAL	7	1,668,000	...	.....	1,668,000
Barium Steel Corporation:					
Chester Blast Furnace, Inc.	1	200,000	...	.....	200,000
Bethlehem Steel Company	29	10,220,000	2	180,000	10,400,000
Colorado Fuel and Iron Corporation	6	1,308,000	.....	.....	1,308,000
E. & G. Brooke Iron Division	1	151,200	.....	.....	151,200
TOTAL	7	1,459,200	.....	.....	1,459,200
Crucible Steel Company of America	2	535,000	...	.....	535,000
Detroit Steel Corporation	1	284,800	...	.....	284,800
Eastern Gas and Fuel Associates	1	200,000	...	.....	200,000
Ford Motor Company	3	1,102,600	...	.....	1,102,600
Globe Iron Company	...	.....	1	100,000	100,000
Granite City Steel Co.	2	450,000	...	.....	450,000
Inland Steel Company	8	2,638,950	...	.....	2,638,950
Interlake Iron Corporation	6	1,298,270	...	.....	1,298,270
International Harvester Company	3	754,400	...	.....	754,400
Jackson Iron & Steel Company	...	.....	1	93,000	93,000
Jones & Laughlin Steel Corporation	13	4,212,000	...	.....	4,212,000
Kaiser Steel Corporation	2	876,000	...	.....	876,000
Lavino & Company, E. J.	...	.....	2	112,000	112,000
Lone Star Steel Company	1	366,600	...	.....	366,600
National Steel Corporation:					
Great Lakes Steel Corporation	3	1,200,000	...	.....	1,200,000
Hanna Furnace Corporation	3	680,000	1	120,000	800,000
Weirton Steel Company	3	1,500,000	...	.....	1,500,000
TOTAL	9	3,380,000	1	120,000	3,500,000
New Jersey Zinc Company	...	.....	2	112,000	112,000
Newport Steel Corporation	1	136,800	...	.....	136,800
Pittsburgh Coke & Chemical Company	2	462,500	...	.....	462,500
Pittsburgh Steel Company	3	954,000	...	.....	954,000
Republic Steel Corporation	21	6,705,000	...	.....	6,705,000
Sharon Steel Corporation	3	652,800	...	.....	652,800
Shenango Furnace Company	2	417,300	...	.....	417,300
Sloss-Sheffield Steel & Iron Company	4	491,710	...	.....	491,710
Tennessee Products & Chemical Corp.	3	210,180	...	.....	210,180
Tonawanda Iron Division	1	171,000	...	.....	171,000
United States Steel Corporation:					
United States Steel Company	49	17,532,500	4	335,400	17,867,900
American Steel & Wire Division	6	1,429,400	.....	.....	1,429,400
Columbia-Geneva Steel Division	5	1,682,700	.....	.....	1,682,700

	PIG IRON		FERROALLOYS		Total annual capacity (N. T.)
	No. of stacks	Annual capacity (N. T.)	No. of stacks	Annual capacity (N. T.)	
Companies (*Continued*):					
National Tube Division	9	3,122,800	...	.....	3,122,800
Tennessee Coal & Iron Division	9	2,468,500	(a)	29,000	2,497,500
TOTAL	78	26,235,900	4	364,400	26,600,300
Wheeling Steel Corporation	6	1,678,500	...	.....	1,678,500
Woodward Iron Company	4	772,630	...	.....	772,630
Youngstown Sheet & Tube Company	12	3,616,000	...	.....	3,616,000
GRAND TOTAL	238	72,700,940	13	1,081,400	73,782,340
Plant Location and Operating Company:					
Alabama					
Birmingham					
Republic Steel Corporation	2	456,000	...	.....	456,000
Sloss-Sheffield Steel & Iron Company	2	281,230	...	.....	281,230
Ensley					
Tennessee Coal & Iron Division	6	1,452,800	(a)	29,000	1,481,800
Fairfield					
Tennessee Coal & Iron Division	3	1,015,700	...	.....	1,015,700
Gadsden					
Republic Steel Corporation	2	471,000	...	.....	471,000
North Birmingham					
Sloss-Sheffield Steel & Iron Company	2	210,480	...	.....	210,480
Woodward					
Woodward Iron Company	4	772,630	...	.....	772,630
TOTAL	21	4,659,840	(a)	29,000	4,688,840
California					
Fontana					
Kaiser Steel Corporation	2	876,000	...	.....	876,000
Colorado					
Pueblo					
Colorado Fuel and Iron Corporation	4	918,000	...	.....	918,000
Illinois					
Chicago					
Interlake Iron Corporation	2	448,020	...	.....	448,020
Granite City					
Granite City Steel Co.	2	450,000	...	.....	450,000
South Chicago					
International Harvester Company	3	754,400	...	.....	754,400
Republic Steel Corporation	1	450,000	...	.....	450,000
United States Steel Company	11	4,196,700	...	.....	4,196,700
Youngstown Sheet and Tube Company	3	684,000	...	.....	684,000
TOTAL	22	6,983,120	...	.....	6,983,120

Official Steel Industry Capacities

Source: The American Iron & Steel Institute

STEEL CAPACITY BY COMPANIES AND T

1936

	Pct of Total
555	23.83
421	21.09
787	13.86
190	11.80
034	2.61
890	5.00
071	5.23
234	2.87
662	4.70
616	3.36
379	3.06
436	1.84
577	0.74
852	100.00

	OPEN HEARTH		BESSEMER		ELECTRIC AND CRUCIBLE		Total annual capacity (N. T.)
	No.	Annual capacity (N. T.)	No.	Annual capacity (N. T.)	No.	Annual capacity (N. T.)	
Kinds:							
Open hearth—basic	907	94,204,500	....	.....	....	.....	94,204,500
Open hearth—acid	34	769,280	....	.....	....	.....	769,280
Bessemer	....	.....	(e) 38	5,381,000	....	.....	5,381,000
Electric	....	.....	....	.....	257	8,232,850	8,232,850
Crucible	....	.....	....	.....	1	40	40
TOTAL	941	94,973,780	(e) 38	5,381,000	258	8,232,890	108,587,670
Companies:							
Alan Wood Steel Co.	8	625,000	....	.....	....	.....	625,000
Allegheny Ludlum Steel Corporation	6	240,000	....	.....	32	577,200	817,200
American Locomotive Co.	6	181,000	....	.....	....	.....	181,000
Armco Steel Corporation	25	2,545,000	....	.....	9	396,000	2,941,000
Sheffield Steel Corp.	14	1,434,000	....	.....	1	150,000	1,584,000
TOTAL	39	3,979,000	....	.....	10	546,000	4,525,000
Atlantic Steel Company	3	188,000	....	.....	....	.....	188,000
Babcock & Wilcox Company	....	.....	....	.....	3	133,450	133,450
Baldwin-Lima-Hamilton Corp.	5	169,920	....	.....	(a) 1	40	169,960
Barium Steel Corporation:							
Central Iron & Steel Co.	5	360,000	....	.....	1	46,000	406,000
Industrial Forge & Steel, Inc.	2	48,600	....	.....	....	.....	48,600
Phoenix Iron & Steel Co.	6	432,000	....	.....	....	.....	432,000
TOTAL	13	840,600	....	.....	1	46,000	886,600
Bethlehem Steel Corp:							
Bethlehem Steel Co.	123	15,466,000	3	336,000	4	158,000	15,960,000
Bethlehem Pacific Coast Steel Corp.	10	456,000	....	.....	3	384,000	840,000
TOTAL	133	15,922,000	3	336,000	7	542,000	16,800,000
Borg-Warner Corporation	....	.....	....	.....	3	30,000	30,000
Boardi Steel Corp.	....	.....	....	.....	2	53,700	53,700
Braeburn Alloy Steel Corp.	....	.....	....	.....	2	20,730	20,730
Byers Company, A. M.	....	.....	....	.....	2	75,000	75,000
Carpenter Steel Company	....	.....	....	.....	7	85,800	85,800
Colorado Fuel & Iron Corp.	20	1,560,000	....	.....	....	.....	1,560,000
Claymont Steel Corp.	7	468,000	....	.....	....	.....	468,000
TOTAL	27	2,028,000	....	.....	....	.....	2,028,000

	OPEN HEARTH		BESSEMER		ELECTRIC AND CRUCIBLE		Total annual capacity (N. T.)
	No.	Annual capacity (N. T.)	No.	Annual capacity (N. T.)	No.	Annual capacity (N. T.)	
Companies (*Continued*):							
Columbia Tool Steel Co.	....	.....	....	.....	2	6,600	6,600
Connors Steel Co.	....	.....	....	.....	2	60,000	60,000
Continental Steel Corp.	5	394,000	....	.....	....	.....	394,000
Copperweld Steel Co.	....	.....	....	.....	7	618,380	618,380
Crucible Steel Company of America	10	867,000	....	.....	24	331,960	1,198,960
(b) Damascus Tube Co.	....	.....	....	.....	3	1,800	1,800
Detroit Steel Corp.	10	650,000	....	.....	....	.....	650,000
Disston & Sons, Inc., Henry	....	.....	....	.....	2	25,000	25,000
Eastern Stainless Steel Corp.	....	.....	....	.....	2	14,400	14,400
Edgewater Steel Co.	3	89,890	....	.....	....	.....	89,890
Empire Steel Corporation	6	409,300	....	.....	....	.....	409,300
Erie Forge Company	5	234,000	....	.....	....	.....	234,000
Firth Sterling Steel and Carbide Corp.	....	.....	....	.....	3	20,040	20,040
Ford Motor Company	10	1,260,000	....	.....	17	261,280	1,521,280
(b) General Services Administration	2	60,000	....	.....	1	12,300	72,300
Granite City Steel Co.	13	720,000	....	.....	....	.....	720,000
Harrisburg Steel Corp.	3	100,750	....	.....	....	.....	100,750
Heppenstall Company	2	50,470	....	.....	1	5,080	55,550
(b) Hoster Steel Corporation	....	.....	....	.....	1	16,920	16,920
Inland Steel Company	36	3,750,000	....	.....	....	.....	3,750,000
International Harvester Company	11	900,000	....	.....	....	.....	900,000
Isaacson Iron Works	....	.....	....	.....	2	102,000	102,000
Jessop Steel Company	....	.....	....	.....	4	33,490	33,490
Jones & Laughlin Steel Corporation	38	4,579,500	6	918,000	1	1,500	5,499,000
Joslyn Mfg. & Supply Co.	....	.....	....	.....	3	37,500	37,500
Judson Steel Corporation	3	76,500	....	.....	....	.....	76,500
Kaiser Steel Corp.	8	1,380,000	....	.....	....	.....	1,380,000
Keystone Steel & Wire Co.	4	400,000	....	.....	....	.....	400,000
Kilby Steel Company	....	.....	....	.....	3	34,020	34,020
Knoxville Iron Company	....	.....	....	.....	2	38,000	38,000
Laclede Steel Company	4	410,000	....	.....	....	.....	410,000
Latrobe Electric Steel Co.	....	.....	....	.....	5	25,200	25,200
Lukens Steel Company	12	675,000	....	.....	....	.....	675,000
McLouth Steel Corporation	....	.....	....	.....	4	581,100	581,100
Mesta Machine Company	4	85,000	....	.....	1	20,000	105,000
Midvale Company	3	135,620	....	.....	6	139,030	274,650
National Forge & Ordnance Company	....	.....	....	.....	3	25,000	25,000
National Steel Corp.:							
Great Lakes Steel Corp.	17	2,600,000	(c) 2	.....	....	.....	2,600,000
Weirton Steel Co.	13	2,500,000	(c) 2	.....	....	.....	2,500,000
TOTAL	30	5,100,000	(c) 4	.....	....	.....	5,100,000

BLAST FURNACE CAPACITY BY COMPANIES AND GEOGRAPHIC LOCATIO

ROALLOYS Annual capacity (N. T.)	Total annual capacity (N. T.)
....	3,122,800
29,000	2,497,500
364,400	26,600,300
.....	1,678,500
.....	772,630
.....	3,616,000
1,081,400	73,782,340
.....	456,000
.....	281,230
29,000	1,481,800
.....	1,015,700
.....	471,000
.....	210,480
.....	772,630
29,000	4,688,840
.....	876,000
.....	918,000
.....	448,020
.....	450,000
.....	754,400
.....	450,000
.....	4,196,700
.....	684,000
.....	6,983,120

	PIG IRON		FERROALLOYS		Total annual capacity (N. T.)
	No. of stacks	Annual capacity (N. T.)	No. of stacks	Annual capacity (N. T.)	
Indiana					
East Chicago					
Youngstown Sheet and Tube Company	2	779,200	...	.....	779,200
Gary					
United States Steel Company	12	4,721,400	...	.....	4,721,400
Indiana Harbor					
Inland Steel Company	8	2,638,950	...	.....	2,638,950
TOTAL	22	8,139,550	...	.....	8,139,550
Kentucky					
Ashland					
Armco Steel Corporation	3	777,000	...	.....	777,000
Maryland					
Sparrows Point					
Bethlehem Steel Company	8	3,252,000	..	.....	3,252,000
Massachusetts					
Everett					
Eastern Gas and Fuel Associates	1	200,000	..	.....	200,000
Michigan					
Dearborn					
Ford Motor Company	3	1,102,600	...	.....	1,102,600
River Rouge					
Great Lakes Steel Corporation	3	1,200,000	...	.....	1,200,000
TOTAL	6	2,302,600	...	.....	2,302,600
Minnesota					
Duluth					
American Steel & Wire Division	2	449,400	...	.....	449,400
Interlake Iron Corporation	1	131,670	...	.....	131,670
TOTAL	3	581,070	...	.....	581,070
New York					
Buffalo					
Hanna Furnace Corporation	3	680,000	1	120,000	800,000
Republic Steel Corporation	2	618,000	.	.....	618,000
Lackawanna					
Bethlehem Steel Company	6	2,472,000	..	.....	2,472,000
North Tonawanda					
Tonawanda Iron Division	1	171,000	..	.....	171,000
Tonawanda					
Colorado Fuel & Iron Corporation	2	390,000		.....	390,000
Troy					
Republic Steel Corporation	1	263,000	...	.....	263,000
TOTAL	15	4,594,000	1	120,000	4,714,000

	PIG IRON		FERROALLOYS		Total annual capacity (N. T.)
	No. of stacks	Annual capacity (N. T.)	No. of stacks	Annual capacity (N. T.)	
Ohio					
Campbell					
Youngstown Sheet and Tube Company	4	1,450,800	...	.....	1,450,800
Canton					
Republic Steel Corporation	1	235,000	...	.....	235,000
Cleveland					
American Steel & Wire Division	2	530,000	...	.....	530,000
Jones & Laughlin Steel Corporation	2	540,000	...	.....	540,000
Republic Steel Corporation	5	1,735,000	...	.....	1,735,000
Hamilton					
Armco Steel Corporation	2	564,000	...	.....	564,000
Hubbard					
Youngstown Sheet and Tube Company	1	200,400	...	.....	200,400
Jackson					
Globe Iron Company	...	.....	1	100,000	100,000
Jackson Iron & Steel Company	...	.....	1	93,000	93,000
Lorain					
National Tube Division	5	1,842,500	...	.....	1,842,500
Lowellville					
Sharon Steel Corporation	1	148,620	...	.....	148,620
Martins Ferry					
Newport Steel Corporation	1	136,800	...	.....	136,800
Massillon					
Republic Steel Corporation	1	238,000	...	.....	238,000
Portsmouth					
Detroit Steel Corporation	1	284,800	..	.....	284,800
Steubenville					
Wheeling Steel Corporation	5	1,444,500	...	.....	1,444,500
Struthers					
Pittsburgh Coke & Chemical Company	1	182,500	...	.....	182,500
Toledo					
Interlake Iron Corporation	2	551,000	...	.....	551,000
Warren					
Republic Steel Corporation	1	516,000	...	.....	516,000
Youngstown					
Republic Steel Corporation	5	1,723,000	...	.....	1,723,000
United States Steel Company	6	2,003,700	...	.....	2,003,700
Youngstown Sheet and Tube Company	2	501,600	...	.....	501,600
TOTAL	48	14,828,220	2	193,000	15,021,220
Pennsylvania					
Aliquippa					
Jones & Laughlin Steel Corporation	5	1,800,000	...	.....	1,800,000
Bethlehem					
Bethlehem Steel Company	7	2,160,000	...	.....	2,160,000
Birdsboro					
Brooke Iron Division, E. & G.	1	151,200	...	.....	151,200
Brackenridge					
Allegheny Ludlum Steel Corporation	*1	*96,000	...	.....	*96,000

TYPES

	OPEN HEARTH		BESSEMER		ELECTRIC AND CRUCIBLE		Total annual capacity (N. T.)
	No.	Annual capacity (N. T.)	No.	Annual capacity (N. T.)	No.	Annual capacity (N. T.)	
Companies (*Continued*):							
National Supply Co.	....	.....	....	.....	3	63,000	63,000
(b) Newport News Shipbuilding & Dry Dock Co.	....	.....	....	.....	3	12,000	12,000
Newport Steel Corp.	7	375,300	....	.....	3	333,200	708,500
Northwest Steel Rolling Mills, Inc.	....	.....	....	.....	1	32,400	32,400
Northwestern Steel & Wire Co.	....	.....	....	.....	3	321,000	321,000
Ohio River Steel Div., Universal Laboratories	4	136,080	....	.....	....	.....	136,080
Oregon Steel Mills	....	.....	....	.....	3	110,000	110,000
Pacific States Steel Corp.	2	132,000	....	.....	4	100,000	232,000
Pittsburgh Steel Co.	12	1,072,000	....	.....	....	.....	1,072,000
Republic Steel Corp.	74	7,550,000	2	665,000	26	1,275,000	9,490,000
Roeblings Sons Co., J. A.	9	204,870	....	.....	....	.....	204,870
Rotary Electric Steel Co.	....	.....	....	.....	5	425,000	425,000
(b) Seidelhuber Steel Rolling Mill Corp.	....	.....	....	.....	1	49,300	49,300
Sharon Steel Corp.	19	1,478,000	....	.....	2	72,000	1,550,000
Simonds Saw & Steel Co.	....	.....	....	.....	3	21,600	21,600
(b) Southwest Steel Rolling Mills	....	.....	....	.....	1	36,000	36,000
Stanley Works	3	188,280	....	.....	....	.....	188,280
Texas Steel Company	....	.....	....	.....	2	22,320	22,320
Timken Roller Bearing Company	3	201,600	....	.....	6	345,600	547,200
Union Electric Steel Corp.	....	.....	....	.....	2	26,760	26,760
United States Steel Corp.:							
United States Steel Co.	215	22,179,700	(d) 8	1,284,000	9	356,500	23,820,200
American Steel & Wire Div.	26	2,093,000	....	.....	....	.....	2,093,000
Columbia-Geneva Steel Div.	21	2,166,400	....	.....	1	12,000	2,178,400
National Tube Div.	15	2,336,000	6	1,188,000	....	.....	3,524,000
Tennessee Coal & Iron Div.	21	3,027,000	(c) 3	.....	....	.....	3,027,000
TOTAL	298	31,802,100	17	2,472,000	10	368,500	34,642,600
Universal-Cyclops Steel Corporation	....	.....	....	.....	5	70,160	70,160
Vanadium-Alloys Steel Co.	....	.....	....	.....	3	11,910	11,910
Colonial Steel Co.	....	.....	....	.....	1	7,020	7,020
TOTAL	....	.....	....	.....	4	18,930	18,930
Vulcan Crucible Steel Co.	....	.....	....	.....	2	9,600	9,600
Washburn Wire Co.	4	93,000	....	.....	....	.....	93,000
Wheeling Steel Corp.	11	1,440,000	2	420,000	....	.....	1,860,000
Youngstown Sheet and Tube Company	33	3,800,000	4	570,000	....	.....	4,370,000
GRAND TOTAL	941	94,973,780	(c) 38	5,381,000	(f) 258	8,232,890	108,587,670

COKE CAPACITY

	BEEHIVE		OTHER		Total annual capacity (N. T.)
	No. of ovens	Annual capacity (N. T.)	No. of ovens	Annual capacity (N. T.)	
Companies:					
Alan Wood Steel Company	.....	.....	151	600,000	600,000
Armco Steel Corporation	.....	.....	110	558,000	558,000
Sheffield Steel Corporation	.....	.....	47	270,000	270,000
TOTAL	.....	.....	157	828,000	828,000
Bethlehem Steel Company	.....	.....	1,916	9,546,000	9,546,000
Colorado Fuel and Iron Corporation	.....	.....	266	1,220,000	1,220,000
Crucible Steel Company of America	.....	.....	184	720,000	720,000
Detroit Steel Corporation	.....	.....	108	480,000	480,000
Donner-Hanna Coke Corporation	.....	.....	252	1,323,000	1,323,000
Eastern Gas and Fuel Associates	.....	.....	204	1,112,000	1,112,000
Ford Motor Company	.....	.....	183	1,314,000	1,314,000
Granite City Steel Co.	.....	.....	49	295,000	295,000
Inland Steel Company	.....	.....	418	2,143,400	2,143,400
Interlake Iron Corporation	.....	.....	333	1,333,400	1,333,400
International Harvester Company	.....	.....	133	600,000	600,000
Jones & Laughlin Steel Corporation	240	252,850	812	3,905,500	4,157,500
Kaiser Steel Corporation	297	160,060	135	586,000	586,000
Kaiser & Frazer Parts Corporation	500	390,990	.....	.....	390,990
Lone Star Steel Company	.....	.....	78	438,500	438,500
National Steel Corporation:					
Great Lakes Steel Corporation	.....	.....	146	1,120,000	1,120,000
Weirton Coal Company	136	120,000	.....	.....	120,000
Weirton Steel Company	.....	.....	249	1,510,000	1,510,000
TOTAL	136	120,000	395	2,630,000	2,750,000
Pittsburgh Coke & Chemical Company	.....	.....	105	685,000	685,000
Pittsburgh Steel Company	574	426,000	74	500,000	926,000
Republic Steel Corporation	296	215,000	1,023	5,245,000	5,460,000
Sharon Steel Corporation	.....	.....	60	225,000	225,000
Carpentertown Coal & Coke Co.	585	375,000	.....	.....	375,000
TOTAL	585	375,000	60	225,000	600,000
Sloss-Sheffield Steel & Iron Company	.....	.....	120	678,000	678,000
Tennessee Products & Chemical Corp.	.....	.....	44	240,000	240,000
United States Steel Corporation:					
United States Steel Company	2,912	2,073,750	2,995	14,369,820	16,443,570
American Steel & Wire Division	.....	.....	294	1,318,270	1,318,270
Columbia-Geneva Steel Division	.....	.....	308	1,312,300	1,312,300
National Tube Division	.....	.....	385	1,766,750	1,766,750
Tennessee Coal & Iron Division	.....	.....	572	2,945,550	2,945,550
TOTAL	2,912	2,073,750	4,554	21,612,690	23,686,440
Wheeling Steel Corporation	.....	.....	251	1,344,000	1,344,000
Woodward Iron Company	.....	.....	226	830,000	830,000
Youngstown Sheet and Tube Company	.....	.....	580	2,784,000	2,784,000
GRAND TOTAL	5,540	3,861,750	12,811	63,198,490	67,060,240

N

	PIG IRON		FERROALLOYS		Total annual capacity (N. T.)
	No. of stacks	Annual capacity (N. T.)	No. of stacks	Annual capacity (N. T.)	
Pennsylvania (*Continued*)					
Braddock					
United States Steel Company	7	2,602,700	...	.....	2,602,700
Chester					
Chester Blast Furnace, Inc.	1	200,000	...	.....	200,000
Clairton					
United States Steel Company	2	528,800	1	85,200	614,000
Donora					
American Steel & Wire Division	2	450,000	....	.....	450,000
Duquesne					
United States Steel Company	5	1,346,200	1	105,200	1,451,400
Erie					
Interlake Iron Corporation	1	167,580	...	.....	167,580
Etna					
United States Steel Company	...	.....	2	145,000	145,000
Farrell					
Sharon Steel Corporation	2	504,180	...	.....	504,180
Johnstown					
Bethlehem Steel Company	5	1,494,000	2	180,000	1,674,000
McKeesport					
National Tube Division	4	1,280,300	...	.....	1,280,300
Midland					
Crucible Steel Company of America	2	535,000	...	.....	535,000
Monessen					
Pittsburgh Steel Company	3	954,000	...	.....	954,000
Neville Island					
Pittsburgh Coke & Chemical Company	1	280,000	...	.....	280,000
Palmerton					
New Jersey Zinc Company	...	.....	2	112,000	112,000
Pittsburgh					
Jones & Laughlin Steel Corporation	6	1,872,000	...	.....	1,872,000
Rankin					
United States Steel Company	6	2,133,000	...	.....	2,133,000
Sharpsville					
Shenango Furnace Company	2	417,300	...	.....	417,300
Sheridan					
Lavino and Company, E. J.	...	.....	1	56,000	56,000
Steelton					
Bethlehem Steel Company	3	842,000	...	.....	842,000
Swedeland					
Alan Wood Steel Company	2	454,800	...	.....	454,800
TOTAL	68	20,269,060	9	683,400	20,952,460
Tennessee					
Lyles-Wrigley					
Tennessee Products & Chemical Corp.	1	36,300	....	.....	36,300
Rockwood					
Tennessee Products & Chemical Corp.	2	173,880	....	.....	173,880
TOTAL	3	210,180	..	.....	210,180

	PIG IRON		FERROALLOYS		Total annual capacity (N. T.)
	No. of stacks	Annual capacity (N. T.)	No. of stacks	Annual capacity (N. T.)	
Texas					
Houston					
Sheffield Steel Corporation	1	300,000	...	.....	300,000
Lone Star					
Lone Star Steel Company	1	366,600	..	.....	366,600
Rusk					
Valencia Iron & Chemical Corporation	1	27,000	...	.....	27,000
TOTAL	3	693,600	...	.....	693,600
Utah					
Geneva					
Columbia-Geneva Steel Division	3	1,200,000	...	.....	1,200,000
Ironton					
Columbia-Geneva Steel Division	2	482,700	...	.....	482,700
TOTAL	5	1,682,700	...	.....	1,682,700
Virginia					
Lynchburg					
Lavino and Company, E. J.	...	.....	1	56,000	56,000
West Virginia					
Benwood					
Wheeling Steel Corporation	1	234,000	..	.....	234,000
Weirton					
Weirton Steel Company	3	1,500,000	...	.....	1,500,000
TOTAL	4	1,734,000	...	.....	1,734,000
GRAND TOTAL	238	72,700,940	13	1,081,400	73,782,340

* Experimental.

(a) Furnace included under pig iron.

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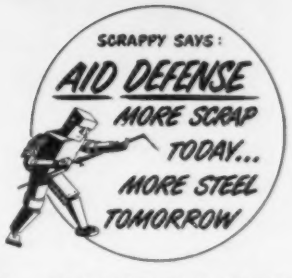

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—Controls—

NPA Sets 3 New Tinplate Grades

National Production Authority has established three new classifications of off-grade tinplate and terneplate through amendment of M-24.

They are "unmended menders," "unassorted temper tinplate," and "other coated secondaries." Agency definitions are:

Unmended mender — a mender which has not been given the extra hot-dipping treatment (largely because of tin shortages).

Unassorted tempers — includes primes, seconds or unassorted tinplate arising in the production of hot-dipped or electrolytic items and packaged without regard to temper.

Other coated secondaries — sheets or strip coated with tin or terne metal which are not defined or elsewhere classified in Section 2 of the order.

Tin Can Order Changes Studied

A revision of M-25, now pending before National Production Authority, would make available to tin can manufacturers about 103,000 tons of secondary products which would not be subject to quota restrictions.

At the same time, the agency is studying the feasibility of shortly lifting all quota restrictions in the order. Industry spokesmen have been urging such action and NPA says that it is "actively considering" this and other industry recommendations.

Industry has proposed that production directives should be confined to tin mill products and that all secondaries should be classified as "other than controlled materials."

Planemakers Will Hold Price Line

A voluntary price-control program will be subscribed to by most producers of aircraft and aircraft parts, industry spokesmen have told government pricers.

There are no completed plans for such a program, though the principle of voluntary control has been agreed to by a number of producing firms.

Fast Coke Cost Pass-On Asked

Beehive coke producers want government pricing officials to prepare for quick action in providing a method of reflecting cost increases if the price of coal jumps sharply.

Spokesmen for the industry told Office of Price Stabilization recently that producers are operating on narrow margins and a substantial rise in the cost of coal, following a possible future wage hike for miners, could not be absorbed.

A solution which might be acceptable to the government and coke producers would be to use profits, figured as a percentage on sales, as a standard for measuring equitable earnings. When OPS officials discussed this possibility with industry spokesmen, the latter agreed to furnish the agency any information needed to establish the yardstick.

For the past year beehive coke manufacturers have been pricing under Supplementary Reg. 13, General Ceiling Price Regulation. Application of SR 13 has been extended to May 31, but producers cannot figure increases in delivered costs of raw materials occurring after Dec. 31, 1951.

Ceiling Boost Helps Lead Supply

Government control officials were told last week that raising inventory ceilings on lead to a 60-day level has helped the supply situation.

Temporary withdrawal from the market of some paint producers also has helped for the moment.

The industry's advisory committee to National Production Authority has postponed until May a decision as to whether to ask removal of allocation controls. The system is said to be working satisfactorily.

Latest forecast by NPA is that the supply will be slightly higher than the now-foreseen demand. Supply is estimated at about 1.3 million tons, including imports, while the projected demand is set at approximately 1.2 million tons.

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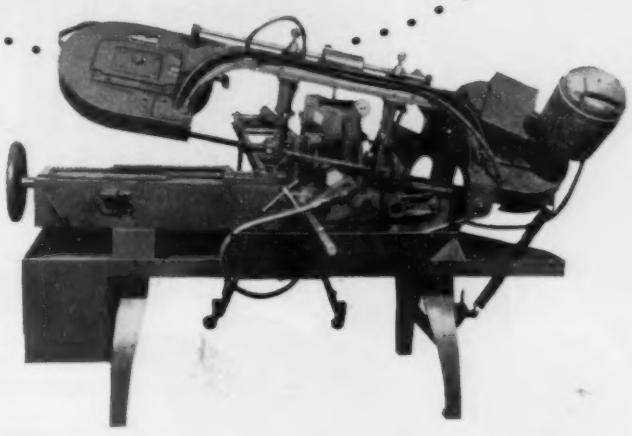

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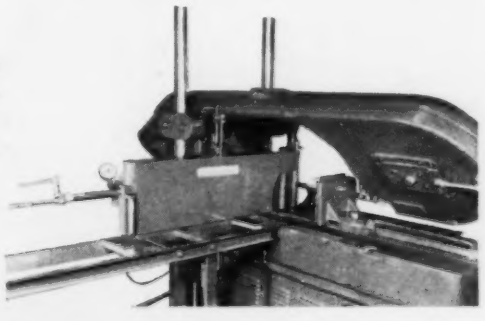
See your Wells Dealer for complete information or write direct.

The illustration above shows the Wells-O-Bar unit attached to a Wells No. 8 Saw. At the right is the unit attached to a Wells No. 12 Heavy Duty Machine.



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Controls

Latest Government Appointments

Washington has recently announced the following appointments in defense and related agencies:

Dr. J. B. Austin, member, Chemical Warfare Committee, Research & Development Board;

N. C. Fick, director, Panel on Metals & Minerals, Research & Development Board;

John C. Houston, Jr., executive vice-president, Munitions Board;

Dr. Urner Liddel, chief, Physics & Mathematics Branch, Research Div., AEC;

David T. Marvel, U. S. representative, Copper-Lead-Zinc Committee, International Materials Conference;

Fred W. Ramsay, chairman, Armed Forces Regional Council for Kentucky, Ohio, and Michigan;

Dr. R. M. Robertson, science director, Office of Naval Research;

Dr. Norman A. Shepard, Materials Committee, Research & Development Board;

Walter J. Williams, assistant general manager for manufacturing, AEC.

Used, Foreign Tool Order Issued

National Production Authority last Friday issued order M-101, which places controls over the distribution of used and imported metalworking equipment.

Under the order, dealers and rebuilders must report inventories to NPA within 15 days after notification to do so; report acquisitions within 3 days of purchase; and disposals within 3 days after sale.

Also, NPA is authorized to direct dealers and rebuilders to withhold from sale specific machinery for 7 days to permit specific purchasers time for inspection.

Affected by the order are 36 types of machine tools but only those priced at $2000 or more and less than 25 years old are covered in the order.

Fast Tax Write-offs:

Steel and transportation expansion figure in ten largest applications.

Approval of 214 new or expanded certificates of necessity by the Defense Production Administration was made public last week. Certificates for accelerated tax amortization involved a proposed investment of $328,856,000.

Of the total amount of proposed investment approved, the 10 largest certificates accounted for more than $135 million or better than one-third the total. Of these top ten, four are steel companies and six account for planned transportation expansion.

Those receiving the ten largest certificates were:

Bethlehem Steel Co., $38,000,000 for coke and pig iron production.

Jones & Loughlin Steel Corp., $22,953,300 for coke ovens.

U. S. Steel Co., $8,311,385 for coal production.

Sharon Steel Corp., $5,522,000 for pig iron production.

Sun Oil Co., $15,200,000 for tanker ships.

Sinclair Refining Co., $12,000,000 for tanker ships.

Louisville & Nashville R.R. Co., $13,363,868 for rail transportation.

Union Tank Car Co., $7,600,000 for rail transportation.

Southern Railway Co., $7,205,000 for rail transportation.

New York Central R.R. Co., $5,153,890 for rail transportation.

"I'm afraid we'll have to let you cleaners go. Shipments go out so fast these days, they don't have time to gather dust."

HEAVIER CUTS IN HARDER MATERIALS AT HIGHER SPEEDS

Get More Production with GORHAM "M-40-B" Tool Bits!

Get more out of your machine tools . . . raise your production curve . . . with Gorham "M-40-B" turning tools! Use "M-40-B" wherever the application of a Super High Speed Steel is indicated, as in machining heat treated alloy steels with large amounts of stock removal at high surface speeds.

"M-40-B" is a Super Moly grade with performance characteristics comparable to those of super tungsten high speed steel. It has extremely high red hardness, high Rockwell hardness, and offers maximum toughness and abrasion resistance. You can take heavy roughing cuts with it at high surface speeds and feeds . . . use it for high speed finish cuts as well.

"M-40-B" comes in square tool bits, 11 stock sizes, and in 23 stock sizes of rectangular turning tools. Bits and turning tools are accurately ground, uniformly hardened, ready to sharpen. Special sizes and shapes to your order. Illustrated with prices are three popular size "M-40-B" tool bits. See your distributor, or send direct for a trial order.

"M-40-B" is one of three cutting tool materials developed by Gorham. Others are Gorham "Standard", for the commercial field, and "Gormet", for turning soft or abrasive stock. They're completely described, with size and price lists, in a new free bulletin. Send for your copy today.

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ROLLER TURNING TOOLS • THREADING TOOLS • SPECIAL TOOLS

—Defense Contracts—

Government Inviting Bids

Latest proposed Federal procurements, listed by item, quantity, invitation No. or proposal, and opening date. (Invitations for Bid numbers are followed by "B," requests for proposals or quotations by "Q.")

Ordnance Tank Automotive Center, Detroit.
Tube frame tee, 20000, 52-1972B, Mar. 28.
Drum brake, 3000, 52-1972B, Mar. 28.
Kit repair hand brake, 4500, 52-1972B, Mar. 28.
Bumper frt spring axle, 27000, 52-2162B, Apr. 8.
Muffler exhaust, 1000, 52-2058B, Mar. 28.
Line flexible eng oil gage, 71000, 52-2037B, Mar. 28.
Clip oil filter inlet line, 20000, 52-1423B, Mar. 24.
Pump oil assy, 2000, 52-1423B, Mar. 24.
Kit repair bevel gear, 22000, 52-1830B, Mar. 24.
Kit repair diff drive gear, 45500, 52-1830B, Mar. 24.
Shaft prop rear axle 22000000, 52-1841B, Mar. 27.
Tachometer assy, 1400, 52-1941B, Mar. 24.
Shell radiator upper, 6000, 52-1987B, Mar. 26.
Armature gen, 13000, 52-1946B, Mar. 26.
Pin eng piston standard, 30000, 52-1778B, Mar. 26.
Facing set driven disk, 12000, 1920B, Mar. 26.
Gear mainshaft, 16500, 52-1942B, Mar. 26.
Bearing transfer control lever frame, 53000, 52-1876B, Mar. 26.
Spring rear assy, 19000, 52-1884B, Mar. 26.
Kit repair eng fuel pump 40000, 52-1948B, Mar. 25.
Shaft propeller w/universal joints, 2000, 52-1831B, Mar. 26.
Bearing bushing type jacket, 26000, 52-1898B, Mar. 26.

Quartermaster Depot, Chicago.
Dispenser drinking water, 6841 ea., 52-1048B, Mar. 27.
Tag identification 2515200, 52-1108B, Mar. 27.
Machine dishwashing, 1250 ea., 52-1071B, Mar. 28.
Spoons table, 379512, 52-1122B, Mar. 31.

Columbus General Depot, Columbus, Ohio.
Hydraulic parts for materials handling equipment, var, 52-357B, Mar. 24.

Detroit Arsenal, Center Line, Mich.
Pump assy, elevation, 2062 ea., ORDMX-P8-Q, Mar. 21.
Connector fixed fire extinguisher, 5600 ea., 52-230B, Mar. 27.
Terminal, special waterseal, copper, 38910 ea., 52-229B, Mar. 26.
Bushing, 61000 ea., 52-227B, Mar. 27.
Shell part, 50000 ea., 52-227B, Mar. 27.
Bushings, 50000 ea., 52-227B, Mar. 27.

Rock Island Arsenal, Rock Island, Ill.
Joint flexible, 3500 ea., 11-070-52-728B, Mar. 25.
Bushing, 1200 ea., Mar. 25.

Springfield Armory, Springfield, Mass.
Screw, 65000 ea., 52-195B, Mar. 18.
Screw, butt plate, 60000 ea., 52-195B, Mar. 18.
Cone, friction, buffer, 15000 ea., 52-195, Mar. 18.
Cup, friction, buffer, 20000 ea., 52-195B, Mar. 18.
Washer, friction, assy, 110000 ea., 52-195B, Mar. 18.
Sight-rear, 25000 ea., 52-193B, Feb. 21.
Scale windage rear-sight, 25000 ea., 52-193B, Feb. 21.
Key buffer, 35000 ea., 52-193B, Feb. 21.
Shield forearm, 55000 ea., 52-193B, Feb. 21.
Screw elevating rear-sight, 20000 ea., 52-193B, Feb. 21.

Lumber Branch, Corps. of Engineer, Portland, Oregon.
Valves gate, 31320 ea., approx. 155-145061520, Apr. 11.

Commandant, Marine Corps., Washington.
Padlocks general purpose, 40200 ea., 855B, Mar. 21.

Navy Purchasing Office, Washington.
Trucks hand, 1600, 3567Q, Mar. 17.
Jacks-ratchet lever, 1408, 3418Q, Mar. 18.
Calipers, 22535, 3385Q, Mar. 18.
Ring-tail 3.25" rocket mts, 100000, 5359-0-B, Apr. 8.

Signal Corps., Supply Agency, Philadelphia.
Intermediate frequency transformers, 36704 ea., 11847-23Q, Mar. 17.

Contracts Reported Last Week

Including description, quantity, dollar value, contractor and address:

Projectiles, 20MM, 100000 ea., $52,500, Pantex Mfg. Corp., Pawtucket, R. I.
Gages, 171, $37,917, Progress Tool & Die Co., Worcester.
Retainer, transmission, 4000, $72,600, Allison Div., GMC, Indianapolis.
Muzzle brake for 90MM gun, T139, 1074, $119,482, The Wheland Co., Chattanooga, Tenn.
Jacks, ratchet lever, 700, $28,721, The Duff-Motor Mfg. Co., Pittsburgh.
Lathes and tools, exceeds $250,000, Guide Instrument & Machine, Inc., New York.
Drills portable electric, 3022, $41,248, Milwaukee Electric Tool Corp., Milwaukee.
Jacks, roller car type, 500, $42,850, Weaver Mfg. Co., Springfield, Ill.
Trailers, warehouse, 555, $81,862, Charley Bros., La Crescent, Minn.
Circuit breaker, $52,886, Kay Electric Supply Co., Atlantic City, N. J.
Sprayer, insect, 3150, $55,534, H. D. Hudson Mfg. Co., Chicago.
Ice plant, 153, exceeds $250,000, Refrigeration Eng. Corp., New York.
Steel pallet rack, 2050, $63,468, Adacar Mfg. Co., Dothan, Ala.
Moist assy, exceeds $250,000, Red Lion Cabinet Co., Red Lion, Pa.
Maintenance parts, 4033 ea., $171,403, W. L. Maxson Corp., New York.
Parts, aviation, 226 ea., $73,902, E. L. Cournand & Co., Inc., New York.
Bearings, 2770 ea., $117,060, S. K. F. Industries, Inc., Philadelphia.
Brake assy, 174 ea., $82,584, B. F. Goodrich Co., Akron, Ohio.
Pump & motor assys, 354 ea., $107,183, Vickers, Inc., Detroit.
Maintenance parts, exceeds $250,000, Douglas Aircraft Co., Inc., Santa Monica, Calif.
Maintenance parts, var, $242,738, Continental Aviation Eng. Corp., Detroit.
Gage, 9565 ea., $89,720, The Electric Auto-Lite Co., Toledo.
Regulator control panel assy, 273 ea., $49,047, Westinghouse Electric Corp., Philadelphia.
Valves, radiator, 12500 ea., $26,245, Marsh Heating Equip. Co., Skokie, Ill.
Valves, gate & globe, 10000 ea., $154,533, Walworth Co., New York.
Tube assy, 3804 ea., $80,474, B. F. Goodrich Co., Akron, Ohio.
Case, 10880 ea., $25,786, Bendix Aviation Corp., Teterboro, N. J.
Valves, Northern Indiana Brass Co., Elkart, Ind.
Dispensers, MK 5, $111,582, Douglas Aircraft Co., Inc., El Segundo, Calif.
Bomb arming controls, AW-A2, $33,054, The Magnavox Co., Fort Wayne, Ind.
Repair parts, 256 line itms, $12,054, International Harvester Co., Los Angeles.
Parts, 4 line itms, $13,693, Pioneer Engineering Works, Inc., Minneapolis.
Automotive repair parts, 104 line itms, $13,695, Willys-Overland Motors, Inc.
Repair parts, 35 line itms, $14,881, Chanslor & Lyon Co., Los Angeles.
Repair parts, 5 line itms, $15,591, Harnischfeger Corp., Milwaukee.
Repair parts, 236 line itms, $23,437, Auto Car Sales & Service Co., Los Angeles.
Repair parts, 150 line itms, $26,285, Fort Wayne Truck Parts & Equipment, Inc., Fort Wayne, Ind.
Repair parts, 359 line itms, $27,211, Reo Motors, Inc., Los Angeles.
Repair parts 65 line itms, $36,415, L. G. Maulhardt, Equip. Co., Oxnard, Calif.
Parts, 325 line itms, $36,758, Northwest Engineering Co., Green Bay, Wis.
Repair parts for motor trucks, 228 line itms, $49,494, Auto Car Sales & Service Co., Los Angeles.
Repair parts, 130 line itms, $62,142, Accurate Truck Parts Co., Chicago.
Repair parts, 726 line itms, $113,081, International Harvester Co., Los Angeles.
Fuze, PD, 20MM, Majestic Mfg. Co., St. Louis.
Locomotive parts, 1160 ea., $20,807, American Locomotive Co., Seattle.
Couplings, caps and ties, etc., 94500 ea., $378,230, Victaulic Co. of America, New York.
Link, launching nose MK-11, 5030 ea., $46,527, Johnson Machine Works, Inc., Charlton, Iowa.
Plate, base, 3345 ea., $206,921, Knox-Warrenton Co., Thomson, Georgia.
Servo motors, 1000 ea., $169,349, Kearfett Co., Inc., Little Falls, N. J.

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- ☐ Choice of Rotary or Centrifugal
- ☐ Capacity matched to the job
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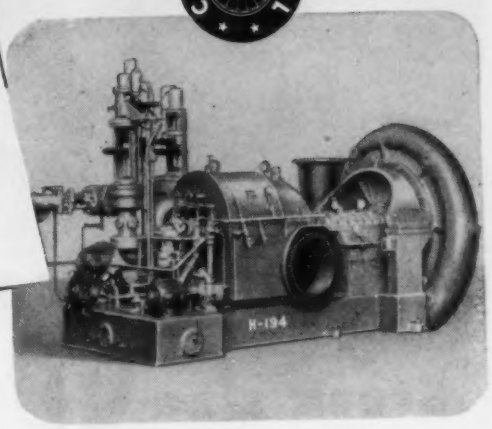

Type OIB Gas Exhauster, driven by steam turbine. Capacity 19,000 cfm.

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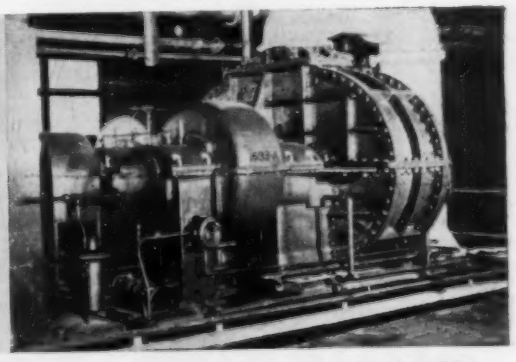
ROTARY

Expected to pay for itself in one year, this electrically-driven R-C Rotary Positive Gas Exhauster replaced three steam-driven units. Capacity 20,600 cfm.



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Special Report

Continued

subcontractor to a big prime has its problems. In some cases a prime contractor must do more of the new defense work himself. Heavy defense production is in some cases a hybrid form of mass production and custom working. Assembly lines slow down. And if cutbacks have enfeebled civilian mass output, subcontracting slims down. Rescheduling defense work also hurts. (See p. 55.)

Roger understands that he can expand his plant if he is approved for a fast tax writeoff certificate. SDPA Chief Telford Taylor has urged a set-aside of small plant writeoffs for every programmed industrial expansion.

Roger knows that writeoffs have gone chiefly to big business, to build up basic industrial capacity. Small business, the fabricating end of production, has remained comparatively aloof. Since Roger's productive capacity will not be overwhelmed by defense work he does not have even an apology to expand.

He knows that in cases where small business was an integral part of the war boom, it has used tax writeoffs extensively.

Pricing Errors—Well, Roger then must be satisfied with what he's got. He next wonders at the time-hardened stiffness of the military's price readjustment system. Roger sees that procurement men must have some defense against the type of bidder who deliberately bids under cost and then seeks redress later. But he feels that honest mistakes can be made, contracts can be delayed, materials prices can spurt upwards—and the small businessman will lose money on a defense contract. Price readjustment takes too long and is sometimes impossible.

Roger is careful not to confuse renegotiation of contracts with price readjustment. (One of the Renegotiation Board's staff told THE IRON AGE that the Board will not consider immediate questions of price readjustments.) These are purely on the procurement level.

Does NPA Intend to Decontrol Metals?

Washington reluctant to admit supply-demand planning has gone astray . . . Congress may have to order decontrol . . . Charge engineer pirating . . . Ore hauling—*By G. H. Baker.*

Take with a grain of salt all those statements from government planners about how decontrol of steel products is "just around the corner."

Fact is, bureaucracy is just as reluctant now as ever to admit that its carefully-prepared paperwork governing the nation's production might is out of balance.

The currently soft metal markets have come as a genuine surprise to Defense Mobilizer Charles E. Wilson and his national planning hierarchy.

Actually, it is important to keep in mind that National Production Authority is talking out of both sides of its mouth when it speaks glibly of the approaching "relative freedom from control" that metal markets will experience in the coming months.

Embarrassing Error — Here's why: Months ago, when premium-priced steel became a drug on the market, Washington dismissed the situation as "a collection of isolated incidents." Today, with many steel products and some nonferrous products selling in easy supply and at established prices, the government is slowly coming to the embarrassing conclusion that it has erred in some calculations of supply and demand.

Specifically, Frank T. McCue, assistant to the director (Herbert Johnson) of the NPA Iron & Steel Div., now predicts that steel will be "relatively free" from allocation controls within 9 or 10 months.

As evidence of good faith, he points out that controls already have been lifted from non-nickel-bearing stainless, and that plans are now under way for decontrol of many secondary steel mill products.

Forced Action — But the basic errors in government planning, and their belated corrections, actually are foredoomed to reluctant execution by NPA.

> **Quote of the Week**
>
> **"It appears from statements made by certain government officials that they believe the wage issues between the steelworkers union and the companies can and should be settled without consideration of the abilities of the steel companies to carry the increased wage costs."**—*Adm. Ben Moreell, chairman, Jones & Laughlin Steel Corp.*

Only the clearest kind of congressional mandate will bring about decontrol of steel, copper, or aluminum in 1952.

Rank-and-file of NPA planners, for many months too close to the White House and too far removed from the realities of the industrial world, is today thoroughly saturated with the idea that "the country will go to hell in a wheelbarrow" if controls should suddenly be removed.

One avenue of solution: Write your congressman!

Pirating Engineers—Government salary controllers are probing what they feel are "questionable" hiring practices among engineering firms.

A nation-wide inquiry of engineering companies has been launched by U. S. Salary Stabilization Board as a step toward ending pirating of workers and widespread job-hopping.

SSB says it has learned that some engineering firms are hiring engineers from industrial employers and then selling back their services—sometimes to the same employers and in some instances at many times their previous earnings.

Firms being investigated are being asked to supply information which will show their hiring rates for 1950, 1951, and 1952, the number of engineers employed by them during those years, and the salary increases granted.

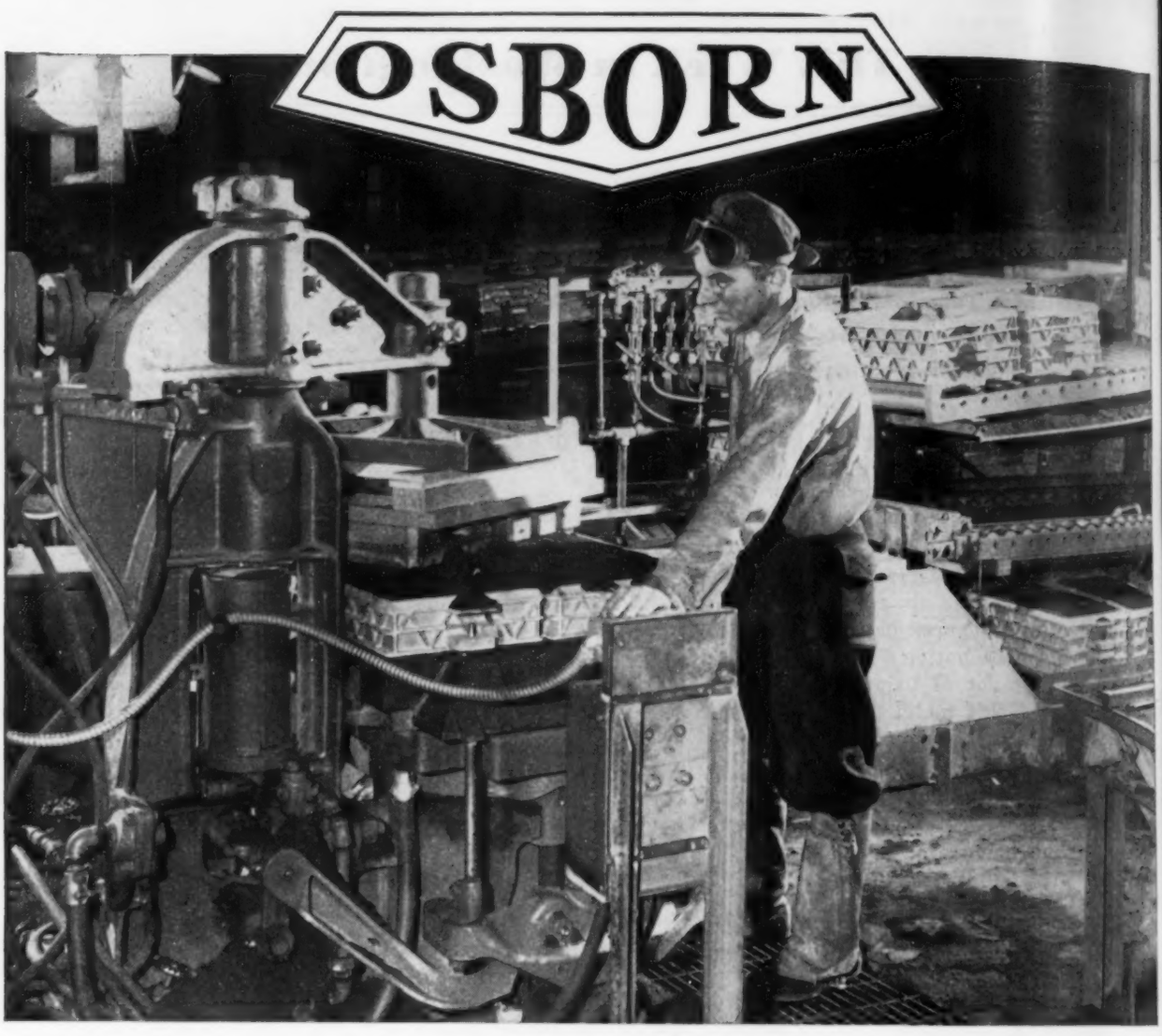
Ore Hauling—Great Lakes ore ships of Canadian registry again will assist in the movement of iron ore between U. S. ports this year.

Both Senate and House committees indicate they will act favorably on legislation to extend through the 1952 shipping season a wartime exemption to federal shipping laws that require water shipments between U. S. ports to employ ships of U. S. registry.

Foreign Aid — Funds available for economic and technical aid to foreign countries are an unknown quantity as Congress sharpens its cleavers before going to work on the $656 million President Truman has asked for this program.

Legislators' comments on this portion of the $7 billion foreign-aid request indicated that even Congressmen favoring this spending are interested in cutting the amount involved. None of the money asked for economic assistance is scheduled for Europe; Asia and the Pacific areas are the largest potential beneficiaries and could get as much as $408 million.

Greatest single item named in the request is the $4,070,000,000 figure for direct military aid to Europe.



Osborn's automatic machines ... cut foundry costs!

MORE OUTPUT . . . over 80% increase in operating efficiency. Less operator fatigue. Uniform quality production, hour after hour. These and other cost-saving benefits are reported by foundries using Osborn automatically controlled, molding machines and core blowers.

In the operation above, the workman simply loads the machine and presses a button. The machine does the rest . . . does it automatically. While the machine goes through its pre-set time cycle, the operator is free to set cores, to inspect completed molds or do other essential work in the production of molds. And there is less scrap due to molding. Less operator training is needed for automatically controlled machines.

Automatic controls are available on many different types of Osborn molding machines and core blowers. A factory-trained foundry specialist near you will gladly show how you can benefit. Call or write *The Osborn Manufacturing Company, Dept. 670, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

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ALUMINUM: Will We Have Enough?

DPA ponders more light metal expansion . . . Facilities now planned will raise capacity to 1,560,000 tons . . . Canada will expand to get U. S. aluminum sales—*By A. K. Rannells.*

Is planned aluminum capacity now under construction sufficient for domestic needs? Or should it be expanded still further—perhaps by 300,000 tons? (See page 52 for industry view.)

These questions are being mulled over by Defense Production Administration which has been tied up in a series of conferences. Some were with aluminum producers, fabricators and technicians. Still another was with top level mobilization officials, including Defense Mobilizer Wilson, Atomic Energy Chairman Dean, Munitions Board Chairman Small, National Production Authority Director Fowler, and Assistant Secretary of State Thorpe.

Scheduled second-quarter production is at an annual rate of 1,280,000 tons. This is expected to increase by 35,000 tons during the third quarter. Completion of presently-planned facilities some time next year is expected to raise the total to a rate of 1,560,000 tons.

Not That Much—Actually, this probably would amount to no more than about 1,470,000 tons in new production. About 90,000 tons of present output is largely marginal or high cost production which could not operate in a time of non-scarcity.

Production officials see the probable total availability, when planned facilities are completed, as about 2 million tons—including estimated imports and scrap recovery.

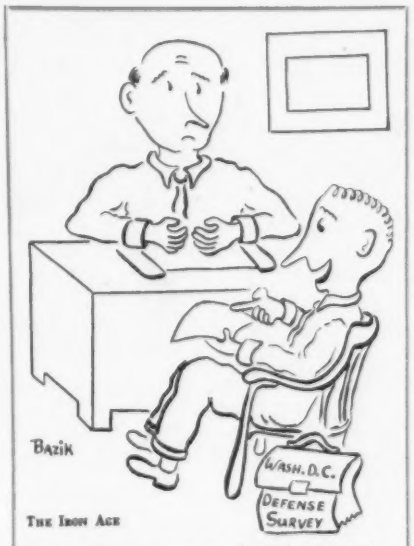
There is mixed feeling at top level as to whether this is enough for the domestic economy. Majority opinion following the top-level conference is that it is enough to see the country through 1960—providing there is no war.

Wants More—But even though demand is reported as softening in spots, Defense Production Administrator Fleischmann is not yet ready to accept this view. He points out that the nation was caught short twice—for World War II and again for the current defense program.

He is convinced that both civilian and defense uses will continue to broaden in the future. In this he has the moral if not literal support of some Air Force officials who are looking to the guided missile program.

"I don't believe the supply is getting any easier," he said. "If we were to increase tickets by 3 or 4 pct we would be back to where we were a month ago."

From Canada — He has announced receipt of an offer by Canada to supply this nation with up to 300,000 tons a year for 5 years at going market prices, beginning about 1955. Canada would undertake this amount of expansion if the U. S. would agree to buy at least 180,000 tons of the new output (for stockpiling) if commercial customers could not be found.



"Are you sure you can't find substitutes for these things called chaplets, flasks, and pigs?"

Neither materials nor financial aid is sought for the projected program.

This offer further complicates the question of more domestic expansion and must be taken into account. And if a new round of aluminum expansion is approved, it must be decided whether it should be limited to smaller companies and the extent, if any, that incentives such as fast tax write-offs and government loans should enter the picture.

Turn-Backs — Meanwhile, control officials were getting ready to distribute aluminum turn-backs from defense agencies amounting to some 15,000 tons. Bulk of this turn-back will be placed with NPA claimant agencies.

Administrator Henry H. Fowler said this would be handed out in supplemental allotments according to need by individual company rather than by industry.

Directed programs, of course, get first preference to make sure all needs are met. Next, attention is to be turned to handing out tickets for small business hardship to assure meeting of all allotments.

Then, NPA will attempt to establish one complete band or level of 30 pct allotment for consumer type goods. If there is enough aluminum, those codes now getting only 25 pct in the less essential categories will be raised to the present 30 pct level of others.

Business Aid — Action in the formation of ten regional advisory boards has been promised by Small Defense Plants Administration. The agency recently appointed members to three boards.

Functions of these boards include:

1. Evaluation of government programs on small business.
2. Recommendations to the SDPA administrator on potential effect of the agency's proposed plans and policies.
3. Proposal of solution of particular problems.
4. Reporting of economic developments and business activities.

Industrial Briefs

Additional Space—BLISS & LAUGHLIN, INC., Harvey, Ill., is making an additional 15,000 sq ft of working space available in its plant. The company is a cold finisher of coils, bars and shafting.

Plant Expansion — CATERPILLAR TRACTOR CORP., Peoria, Ill., will expand its Joliet, Ill., plant and has been requested by National Production Authority to expand its East Peoria, Ill., facilities as well.

Film Available—Research & Control Instruments Div., NORTH AMERICAN PHILIPS CO., INC., Mount Vernon, N. Y., has a 30-min, 15mm sound film available dealing with the subject of electron microscopy. The movie explains the operation and application of the new instrument and illustrates some of the work that can be performed with the aid of this powerful research tool.

Safety Award—The Steubenville, W. Va., plant of WEIRTON STEEL CO. has received the Thomas E. Millsop Safety Award Plaque for the best safety record in the company during 1951. The award is based on lost-time accident rates.

New Offices—WELLMAN BRONZE & ALUMINUM CO., Cleveland, has opened new offices for its executive, sales, accounting and purchasing departments covering 4,600 sq ft.

New Facilities—Plans for construction of a new $2 million Haskell Laboratory of Industrial Toxicology near Newark, Del., have been announced by Du Pont. This building will provide enlarged facilities for the company's industrial toxicology laboratory which has been located in Wilmington since 1935. The new facilities have become necessary as this work has steadily expanded with the increase in the company's operations.

Two-Day Clinic—The chief subject of a 2-day clinic sponsored by the DAYTON CHAPTER, of AMERICAN INSTITUTE OF INDUSTRIAL ENGINEERS, Dayton, will be increasing production efficiency through methods improvement, work measurement, and wage incentives.

ELECTED: Joseph A. Sowell, Brewton, Ala., new president of the Wirebound Box Manufacturers Assn., is congratulated by his predecessor, A. L. Whiton, Chicago. Scene is the association's annual meeting in San Francisco recently.

Break Ground—C. H. WHEELER MANUFACTURING CO., Philadelphia, broke ground for a $600,000 addition to their plant in Philadelphia. The new building will be equipped with 30-ton cranes and will be 300 ft long.

Plant Purchased—THE SCHAIBLE CO., Cincinnati, manufacturers of plumbing and heating equipment, has purchased a plant in Mariemont, Ohio. The building covers 140,000 sq ft of floor space, is over 600 ft long and is on a tract of land covering 6 acres.

Scrap Metal Collected—With 8,136,953 lb reported during January, GENERAL MOTORS CORP., plants, dealers and suppliers have collected a total of 101,645,980 lb or more than 45,377 gross tons of non-production scrap metal since July 1. The total tonnage is the weight equivalent of the steel and iron in 31,994 average-weight automobiles.

Electrical Equipment — WESTINGHOUSE ELECTRIC CORP., has received an order from Reynolds Metals Co., Richmond, Va., for more than $5 million of electrical equipment to be installed in a new aluminum reduction plant near Arkadelphia, Ark. The order is for 24 assemblies of ignitron rectifiers, with 12 in each assembly, and related electrical machinery.

Expansion Announced — GENERAL ELECTRIC CO., New York, has announced the expansion of its aviation equipment business to include a new operation for design, manufacture, and sale of turbine-driven accessories for jet engines and aircraft.

New Division — AMERICAN CAN CO., New York, has created a new Packaging Development Div., in the General Sales Dept., designed to further step up the company's continuing research for developing new containers and new uses for existing ones. The operation of this new division will be under the supervision of T. F. Brennan, who has been named manager.

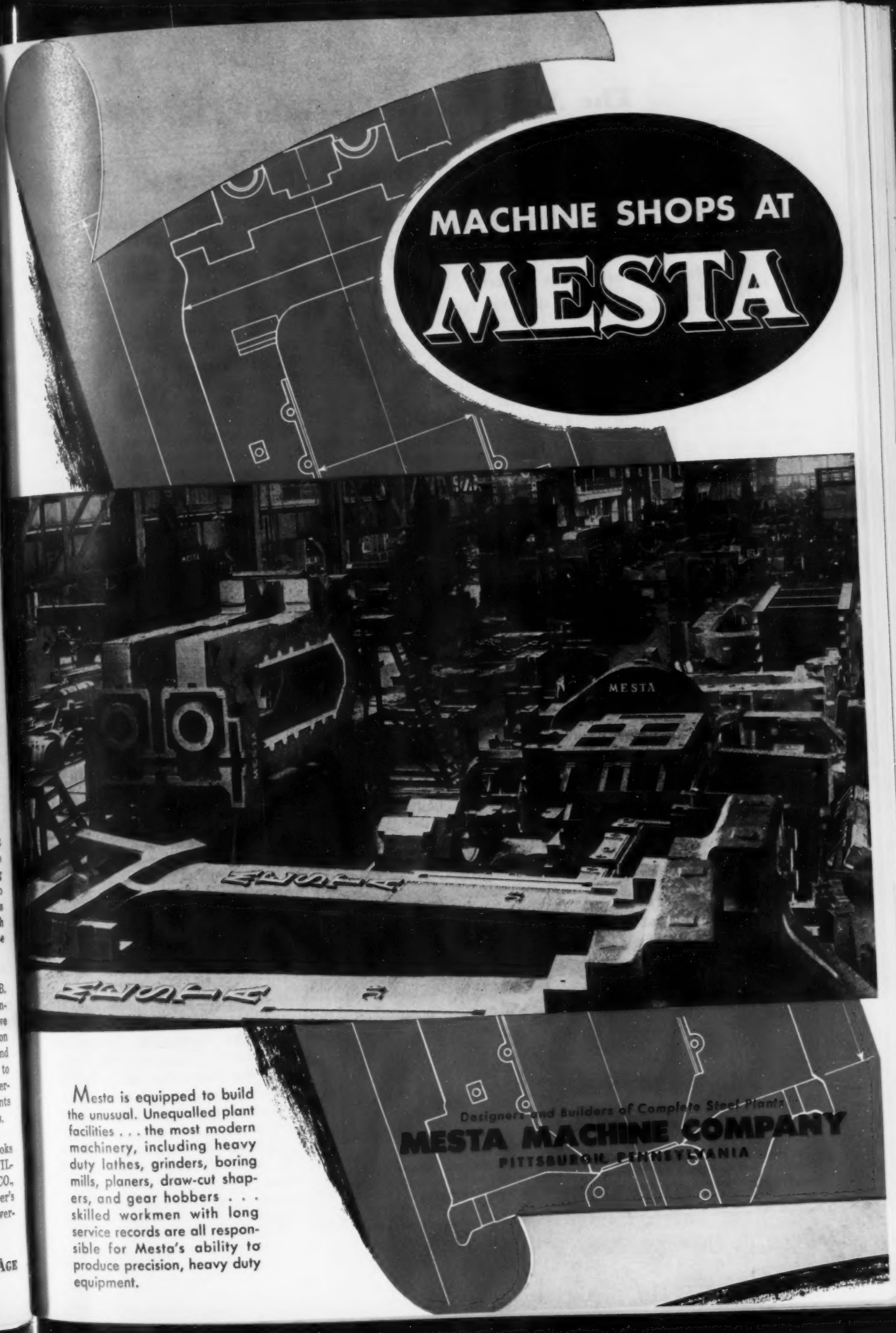
Construction Started—TOWNSEND CO., New Brighton, Pa., has started construction of a new $500,000 plant for its Cherry Rivet Co., Div., at Santa Ana, Calif., to meet increased demands by the U. S. Armed Forces for Cherry Blind Rivets for use in its aircraft program.

New Company—Peter Brehm has organized his own company to build wire stitching machines of all types and preformed foot power staplers. This new company is called AMERICAN WIRE STITCHER MFG. CO., Racine, Wis.

Heavy Presses—The Air Force's eight heavy presses have been assigned to aluminum producing and fabricating companies. They will be used to stamp out in one piece aircraft parts of tremendous size and strength which otherwise would have to be assembled by hand.

New Executive Offices—CLAUDE B. SCHNEIBLE CO., Detroit, has announced the opening of new executive offices in Detroit at 212 Stephenson Building on the corner of West Grand Boulevard and Cass. In addition to the executive staff the Sales-Advertising and Accounting Departments will operate from the new quarters.

Appointment — The Cleaver-Brooks Co., Milwaukee, has appointed WILSON-WEESNER-WILKINSON CO., Nashville, Tenn., as a manufacturer's representative for the sale of Cleaver-Brooks boiler equipment.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Mesta is equipped to build the unusual. Unequalled plant facilities . . . the most modern machinery, including heavy duty lathes, grinders, boring mills, planers, draw-cut shapers, and gear hobbers . . . skilled workmen with long service records are all responsible for Mesta's ability to produce precision, heavy duty equipment.
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Car Sales Higher Than Production

Industry confident it can sell all it is allowed to build . . . Some fear new auto black market . . . Truck sales outstrip replacements as possible shortage looms — *By R. D. Raddant.*

As the 1952 automobile production year swings into high gear, it is becoming clear that the auto industry can sell all the units allotted by the National Production Authority and that demand will continue in excess of supply.

In spite of continuing talk of buyers' resistance, figures show both trucks and passenger car sales exceeding production. Industry leaders have gone so far as to predict the possibility of a new auto black market unless more cars can be produced.

January retail sales of passenger cars totaled 294,023 compared with production of 269,367. New car stocks have declined from the high point in May, 1951 of 426,591 to 319,606 on Feb. 10, 1952.

Need Trucks Too—Truck sales are also forging ahead of production. The industry predicts that there may be a serious shortage before the end of the year. Only about 832,000 new trucks will be produced this year against the average 1,117,000 built for the market in the 5 preceding years.

To bolster the industry's requests for a second quarter quota of 1 million cars, it is pointed out that more than 4 million cars will be scrapped during the year. A quota roughly equal to that would leave the expanding market unsatisfied. The industry is sure it could sell 5 million cars if it could produce them.

Meanwhile, production lines are moving rapidly. Despite the slow start at the first of the year, almost all companies will reach their first quarter quotas. The principal exception is Nash, which lost time in a new model changeover. But Nash has been assured any shortage in output in the first quarter will be added to the second quarter quota.

Less Weight—Commercial transportation's willingness to pay premiums in exchange for weight saving and a resulting increase in truck payloads has greatly extended the field for magnesium use in the automobile industry.

As weight limitations become stricter and violation penalties more severe, truckers find it economically sound to use higher cost magnesium products in exchange for larger loads.

A 9-lb magnesium wheel has been demonstrated to be a satisfactory substitute for a 20-lb fabricated steel wheel. It is reported to have more denting resistance and to run truer than a fabricated steel wheel with a reduced tendency to shimmy.

Not for Cars—These reported advantages are not sufficient to overcome the additional cost for passenger cars, however, although in the higher price bracket cost might not pose such an obstacle.

In the commercial field, substitution of magnesium wheels could add an extra 450 lb of cargo weight to an average truck load. In a year's time, this could result in more than $1000 profit.

"Git!"—One development of the recent probings of the House of Representatives Un-American Activities Committee in Detroit was the refusal of many auto laborers to work with men and women named as Communists before the committee.

A small wave of sitdown strikes surged through the Chrysler, Briggs Body, and Midland Steel plants when committee testimony disclosed that fellow workers were, or once were, party members. In some cases those named were hustled to the gates or given a deadline to be off the job.

The committee stages a return engagement this week for extensive probings of Local 600 United Auto Workers (CIO) when attempts at Communist domination of the huge Ford Local will be aired.

No Subs—A panel discussion of radiator material substitutions before the Society of Automotive Engineers Passenger Car, Body, and Materials Meeting in Detroit failed to turn up any fast or easy way to save copper in radiator design.

As Joseph Gurski of Ford Motor Co. put it, "Copper and brass have been completely adequate. No other radiator can make that claim."

ANNIVERSARY: Last truck built by Studebaker in its first century of operations draws aside the once-familiar Studebaker farm wagon. Company officials watching at left are, left to right: Lloyd Ransom, truck plant superintendent Kenneth B. Elliott, executive vice-president; and Richard G. Hudson, truck division manager.

QUOTAS: Detroit Happy Over Boost

NPA allows second-quarter production of 1,050,000 cars and 250,000 trucks . . . Figures a compromise, but all parties are pleased . . . Industry must find materials in its inventories.

Announcement by National Production Authority that the automotive industry will be able to build 1,050,000 cars and 250,000 trucks in the second quarter gave a much-needed shot in the arm to depressed Detroit.

Up to a short time before the new quotas were announced, automakers believed the level would be set at only 1 million rather than the 1,100,000 asked by the industry. The compromise figure was satisfactory to all.

It appeared to both the industry and labor as a victory in focusing the spotlight on the serious troubles caused by cutbacks.

Up to Industry — One not-so-serious handicap is found in the NPA ruling. Only enough steel, copper, and aluminum will be alloted to make 1 million cars. It will be up to the industry to find these materials in their inventories or ease the situation by substitution or conservation.

This situation is not so bad as it sounds because under earlier quotas of 930,000 cars and 220,000 trucks NPA would have granted only enough copper for 800,000 cars and aluminum for 850,000, and steel for 900,000.

The boost is still not sufficient to put many jobless workers back on the assembly lines but will only avoid further layoffs in the second quarter, auto industry spokesmen said. It was estimated, however, that 50,000 jobs were saved by the quota increase.

What Is Needed — Early last week, motor vehicle manufacturers had met with DPA and advised the agency that in order to meet the 1,000,000 and 250,000 unit levels, the following amounts of materials would be needed:

Passenger cars—Carbon steel, 22,546 tons; alloy, 2123 tons; stainless, 93,000 lb; copper brass mill products, 1,022,000 lb; copper wire mill, 307,000 lb; copper foundry, 306,000 lb; and aluminum, 616,795 lb.

Trucks — Carbon steel, 22,916 tons; alloy, 5593 tons; stainless, 56,000 lb; brass mill, 387,000 lb; wire mill, 183,000 lb; copper foundry, 48,000 lb; and aluminum, 276,000 lb.

Increasing the permitted production level does not automatically assure materials tickets for the foregoing amounts, DPA said. In fact, it was indicated that allocations would be somewhat less than industry said would be necessary to reach the permitted levels.

Officials said the actual allocations would probably be made on an individual company basis, taking into consideration varied factors such as inventory position, hardship, labor distress, etc.

New Nash Body on Display

Showing the results of a $16 million retooling job and the innovation of a Panin Farina body design, the Nash Motors' 1952 Golden Anniversary models were announced today. They will be on display in showrooms Mar. 14.

In addition to the new body styling, the 1953 Nash features a new type "Airflex" front end suspension; increased roominess; "Road Guide" front fenders and lower hood for greater visibility; increased engine horsepower; safety instrument panels; and glass area increased up to 25 pct.

The new Ambassador has a six-cylinder overhead-valve engine with horsepower increased from 115 to 120. The Statesman model has a six-cylinder L-head engine.

THE BULL OF THE WOODS — By J. R. Williams

YOUR CAR IS OUT OF GAS, SO I'LL PUT IN A GALLON OF SHOP GAS TO GO UP AN' GET THOSE PAPERS YOU LEFT HOME!
WAIT, ALLEN, DID YOU SAY ONE GALLON?
THAT'S A NEW HAND HE'S BREAKIN' IN TO USE HIS CAR FOR A COUPLA BLOCKS--OL' ERNIE ALWAYS PUT IN TEN SHOP GALLONS!
TH' BULL ALWAYS FORGETS SOME PAPERS AT HOME WHEN HE'S LOW ON GAS--HIS CAR IS ONE THING HE DON'T MIND BEIN' OVER-PAID!
3-14
J.R.WILLIAMS
THE GREENHORN
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Saving Weight

TO SAVE MORE LIVES

How SPEED NUTS made important weight savings attaching plexiglas panels in Kaman Helicopter.

Let the engineers at Kaman Aircraft Corp., Windsor Locks, Conn., tell you how Flat-Type SPEED NUTS performed for them. "We found that lightweight SPEED NUTS provide a large bearing surface which eliminates the need for flat washers under nut. *They reduce the weight up to .31 pounds per hundred when replacing other lock nuts, not including savings on weight of washers.*

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Upper plexiglas panel is attached to frame in HTK-1 Helicopter by means of Flat-Type SPEED NUTS and machine screws. Detail of vibration-proof assembly is shown below.
TINNERMAN
Speed Nuts*
FASTEST THING IN FASTENINGS

Yolo Ready to Build Blast Furnace

New facilities announced . . . Yolo Steel receives $44 million certificate of necessity for new California blast furnace . . . Report no trouble with personnel, raw materials, costs.

More iron and steel for the West were promised last week.

From Washington came word that Yolo Steel & Metal Corp. had received a $44-million certificate of necessity. Write-offs will be used to build a blast furnace in central California. G. I. Dumond, Yolo president, told THE IRON AGE that the 1000-ton-per-day furnace would be in production in 12 to 18 months.

Concept of the project has changed in the last year from a $264-million program involving strip mills to primary iron production. Defense Production Administration denied Yolo a certificate of necessity for the higher amount last December. Now, with pressure from Wyoming, planned coal source for the furnace, and from Sen. Nixon of California, the write-off has been granted for a modified facility.

Who Takes the Risk? — Last week no one seemed to be able to find out who was putting up the more than $60 million to finance the new blast furnace and coke ovens. Mr. Dumond insisted he isn't looking for financing and that he has already invested more than a half million dollars in the project.

He denied that foreign capital is interested. (There was some conjecture that the Japanese steel industry might be interested. That country has been paying about $30 per ton for 50 pct Fe American iron ore in Japan.) A check with Japanese officials in San Francisco indicated that this would make sense. But the non-availability of Japanese speculative capital at high rates of interest precludes this possibility even if the peace treaty is signed.

However, pig iron is on the Japanese "semi-automatic approval system." So there is the possibility that Yolo is working on the theory that pig iron contracts with that nation might support the operation for some time.

Fast Start—Mr. Dumond stated that construction of the blast furnace will start within the next 60 days and that currently three major, experienced steel plant contractors are bidding on the job. He also said that two or three top-flight iron production men have applied for work with his company and that scores of other operations men have been seeking employment in this newest western iron production unit.

Raw Materials—Yolo's situation is reminiscent of 1940-41. Then it was widely proclaimed that there were no raw materials (iron ore and coal) in the West to justify a blast furnace. Now, the same situation confronts Yolo Steel.

"Ha, Ha, Sanders—the first one off the production line and the military just informed us it's now obsolete!"

Mr. Dumond told THE IRON AGE his company has tied up enough low grade ores in Shasta County to keep the proposed furnace operating 20 to 40 years even without tapping ore in Madera County.

More Steel, Iron—Steel production at Kaiser Steel Corp.'s Fontana, Calif., plant will rise by 156,000 ingot tons annually and pig iron output by 438,000 tons under a $65 million privately-financed expansion program. A third blast furnace will increase pig iron production by 50 pct and a ninth openhearth will raise steel output by more than 11 pct.

Other phases of the program will include installation of 90 by-product coke ovens to make 408,000 tons of coke a year, two additional stands for the present hot strip mill to make possible rolling and finishing of lighter and wider sheet. Buildings and facilities at company iron ore and coal mines will also be expanded.

Funds will come from seven banks, which will loan the firm $27.5 million, seven insurance companies, which will buy $27.5 million in first mortgage bonds, and $10 million in corporate funds.

Schedules—Construction on this expansion begins immediately. The blast furnace will be completed by spring of 1953 and the openhearth by December, 1952.

The openhearth will have an average capacity of 225 tons per tapping and the blast furnace a capacity of 1200 tons per day.

These banks are participating in the new loan: Bank of America, San Francisco, California; Mellon National Bank, Pittsburgh, Pennsylvania; Chase National Bank, New York City; Manufacturers Trust Company, New York City; First National Bank of Chicago; Chemical Bank and Trust Company, and Marine Midland Trust Company, New York City.

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Metal Cutting MARVEL SAWS

Better Machines–Better Blades

How to Preserve Industry After War

Machine tool reps and Washington officials seek way to keep industry healthy after crisis . . . What can be done on controls, taxes, stockpiling of defense tools—*By G. Elwers.*

High-level talks are going on in Washington between government officials, military leaders, and machine tool industry representatives. The object is to find a way to keep machine tool productive capacity high after present defense buying tapers off.

If this can be done the industry will be better fixed to meet emergency defense requirements than it was when Korea hit.

Whatever plans are developed will probably not resemble the much - publicized billon - dollar stockpile of brand new tools. This idea never had the support of top military officials, nor of Mobilization Boss C. E. Wilson. Since the industry is strongly opposed the idea's chances seem slim.

"Leave Us Alone" — Actually, what the industry wants is not so much government help as absence of government hinderance.

A current example is the tight prohibition of shipments of machine tools to customers without priority ratings.

Though the overall industry backlog is still high, it is not evenly distributed among machine tool builders, nor among the various models of individual builders. Some critical items, ordered with high priority today, could not be delivered before 1954. But on many types and models of machine tools delivery dates are less than a year.

Non-Rated Business—In World War II the industry was allowed to build what non-priority equipment it could after meeting priority orders. There are many firms now which could accept non-rated business. Soon they will need it if they are to keep their labor force and productive capacity at high levels.

Present regulations do permit acceptance of non-rated orders if business falls off to a low level. But the object is to keep business, and productive capacity, at a high level. So builders want the right to take up any slack as it appears, with acceptance of civilian business.

Foreign Trade — The industry also wants revision of current government policies which are contributing to melting away of foreign markets. Foreign business is extremely important to the industry in peacetime.

It is being lost now to revitalized European machine tool builders. The U. S. industry wants no aid from the government in this fight, just freedom to compete as best it can for the overseas business it is losing now.

Stockpile Solution — Another problem is the huge amount of machine tools now being bought for defense. After World War II great quantities of defense tools were sold to private industry. This competition with new machine tool sales threw the industry into a depression which prevented its getting a fast start after Korea.

If any stockpiling is to be done, the industry hopes it will be done from the current defense machine tools, so these tools will not appear on the market at low prices.

Help on Taxes—Biggest boon to keeping the industry strong in peacetime would be an enlightened tax amortization policy. An industry leader recently pointed out that even the British Labor government allowed fast tax writeoff on machine tools at any time—not just in wartime.

Recognition by tax officials that machine tools become obsolete before they can be fully depreciated would be the best medicine for machine tool sales. Many business groups have long contended, and experience in other countries seems to show, that the net result to the treasury would be higher, not lower, tax income.

Storm's Passed—Order cancellations, which were about 16 pct of new orders in January, were also high in February. But toward the end of the month, the flood of cancellations appeared to be ending.

Having ridden out this first phase of the Air Force shakeup of its schedules, the industry now awaits reordering for the revised programs. Almost all the cancellations were from Air Force contractors, though some 300 machines for Britain were also killed.

Cancellations or no, it looks like machine tool business will be kept at high levels by defense through 1954 at least.

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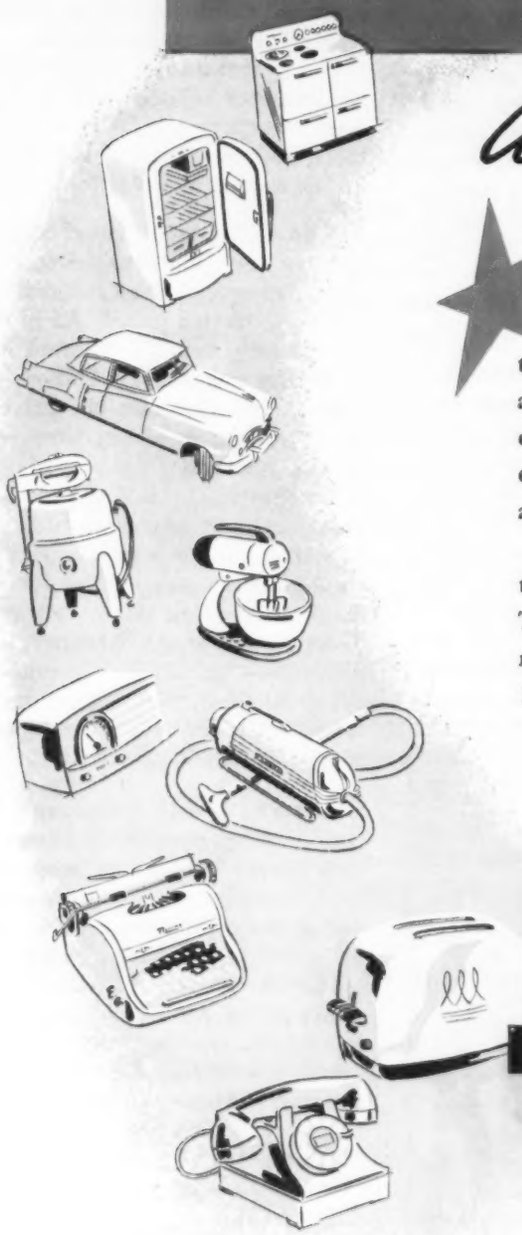

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Looking for a Better

The Iron Age

SALUTES

Alwin F. Franz

He has all the credentials to fit him for leadership of the nation's ninth steel company.

ALWIN FRANZ has all the qualities which should make him a fine president of Colorado Fuel and Iron Corp. Priceless mill operating experience, cagey judgment, and sound character fit him to meet the challenge of his new high job.

In addition to his wide experience in the steel industry he has an intimate knowledge of his own company, having managed CF&I's two largest plants.

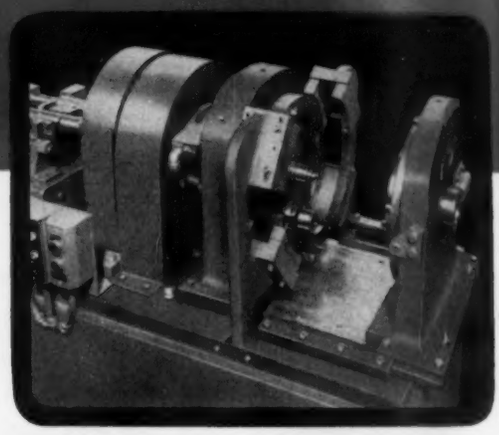
Before joining CF&I in 1945, he was general superintendent of the Steel Div. of Alan Wood. He served as vice-president in charge of operations, became a director in 1948, and executive vice-president in 1949, before being elected president of CF&I last week.

In addition to his fine operating record, he has helped his company mark up an outstanding score in labor relations and safety. In October of last year the National Planning Assn. published a book called "Causes of Industrial Peace Under Collective Bargaining." Subject of this case history praise was the Minnequa Plant of CF&I.

The book is fairly well sprinkled with quotes from Executive Vice-president Alwin Franz: "Labor relations are 90 pct common sense and thinking about the other person as one thinks about oneself . . . We know that labor leaders have a tough job, and we respect their integrity in doing it."

These aren't hollow words. Al Franz doesn't believe in making a statement unless he intends to do something about it. People always know where they stand with him—and they like it.

Looking for a Better Way to Cut Tubing



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McK

The Iron Age

INTRODUCES

Alwin F. Franz, elected president, COLORADO FUEL & IRON CORP., New York (see page 85). **Car. W. Meyers,** formerly president, elected vice-chairman of the board.

Walter A. Rentschler, appointed vice-president in charge, Eddystone Div., and will remain in charge of the Hamilton plant; **J. F. Connaughton,** appointed general manager, Hamilton plant; **Alex Smith,** appointed manager, newly created Export Sales Dept.; and **C. A. Campbell,** formerly head of export sales, Eddystone Div., becomes assistant manager, BALDWIN-LIMA-HAMILTON CORP., Philadelphia.

John T. S. Byrne, appointed district supervisor, Pittsburgh; and **James L. Craddock,** appointed to succeed Mr. Byrne as district supervisor, Pacific Coast and Rocky Mountain audit district, U. S. STEEL CO., San Francisco.

W. C. Schuller, named assistant general purchasing agent, CATERPILLAR TRACTOR CO., Peoria, Ill.

Charles A. Bennett, elected vice-president, BRACE-MUELLER-HUNTLEY, INC., Syracuse, N. Y.; **Carl F. Wattell,** sales manager, Rochester, N. Y., sales department, and **Frederick S. Brace,** Buffalo office, elected to the board of directors.

Nelson C. Dezendorf, appointed general manager, Electro-Motive Div., GENERAL MOTORS CORP., Detroit.

William R. McNally, appointed representative, pulp and paper industry, LINK-BELT CO., Chicago. He succeeds H. F. R. Weber, who has resigned.

Donald E. Craig, named manager, Somersworth, N. H. plant; **John C. Garrett,** named acting manager of marketing; **Leo P. Hannaway,** named assistant to manager of marketing; and **Jeremiah E. McQuillan,** named manager of marketing services, Meter and Instrument Dept., GENERAL ELECTRIC CO., Lynn, Mass.

H. O. Fullam, appointed chief industrial engineer in charge of Methods Engineering, Tool Engineering, Tool Manufacturing and Maintenance of Plant Equipment, C. H. WHEELER MFG. CO., Philadelphia.

James W. Minter, appointed district sales manager, Birmingham office, A. P. GREEN FIRE BRICK CO., Mexico, Mo.

Robert W. Ellms, promoted to assistant chief engineer, and **Ted Hatch,** elevated to supervisor, Research and Development Dept., Machine Div., OSBORN MFG. CO., Cleveland.

Otto G. Schwenk, named vice-president in charge of industrial products, BLAW-KNOX CO., Pittsburgh.

Phil Sprague, Jr., appointed executive vice-president, HAYS CORP., Michigan City, Ind.; and **Paul B. LeBoeuf,** succeeds Mr. Sprague as advertising manager.

Woods G. Talman, appointed assistant general superintendent, Gary, W. Va., and Lynch, Ky., districts, coal division, U. S. STEEL CO., Pittsburgh.

Richard W. Dalzell, manager of Commercial Research, promoted to assistant manager, Market Development, LUKENS STEEL CO., Coatesville, Pa.

L. W. PRESTIN, elected vice-president in charge of the Industrial Furnace Div., Sunbeam Corp., Chicago.

JOHN M. PHILLIPS, JR., formerly vice-president and general manager, elected president, Phillips Mine & Mill Supply Co., Pittsburgh.

PETER V. MARTIN, appointed vice-president, Engineering and Construction Div., Koppers Co., Inc., Pittsburgh.

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1003 Fisher Bldg., Detroit 2, Mich.

Personnel

Continued

W. T. Ingram, appointed general sales manager, Pacific Coast region, REYNOLDS METALS CO., Louisville; **W. K. Allen Ferguson,** who preceeded Mr. Ingram as general sales manager, appointed general dirctor, pricing, General Sales Organization headquarters, Louisville; and **Hayden Clement,** appointed sales manager, packaging markets.

Raymond S. Wood, appointed general manager, Ball & Roller Bearing Plant, LINK-BELT CO., Indianapolis. He succeeds C. V. Loughery, who has retired.

James M. Walton, appointed plant industrial engineer, Midland Works, CRUCIBLE STEEL CO. OF AMERICA.

John E. Cinkosky, appointed Eastern zone manager, Mercury Clutch Div., AUTOMATIC STEEL PRODUCTS, INC., Canton, Ohio.

Albert F. Davis, administrative engineer, Detroit Diesel Engine Div., GENERAL MOTORS CORP., Detroit, appointed works manager. He succeeds **George A. Zink,** who has been named assistant general manager, Fabricast Div., Bedford Ind.

W. A. Raines, named assistant manager, Industrial Dept., New York district, Apparatus Sales Div., GENERAL ELECTRIC CO., Schenectady.

Stanley D. Margerum, joins R. M. HOLLINGSHEAD CORP., Camden, N. J., as manager of special products, Industrial-Aviation Div.

L. J. Carson, formerly general manager, Minneapolis plant, LINK-BELT CO., named general manager, new Link-Belt plant, Colmar, Pa.

Orrin W. Barker, formerly assistant chief engineer, promoted to chief engineer, KEARNEY & TRECKER CORP., Milwaukee.

Martin E. Gilwood, appointed director of research, PERMUTIT CO., New York.

Robert Hughes, appointed engineering manager, Engineering Works Div., DRAVO CORP., Pittsburgh.

John K. Rye, appointed assistant general manager, F. JOS. LAMB Co., Detroit.

CHARLES H. FITZWILSON, appointed chief metallurgical engineer, Columbia-Geneva Steel Div., U. S. Steel Co., San Francisco.

WILLIAM H. WORRILOW, JR., appointed general sales manager, Lebanon Steel Foundry, Lebanon, Pa.

ROBERT B. FREEMAN, promoted to assistant to the vice-president, operations, Columbia-Geneva Steel Div., U. S. Steel Co., San Francisco.

ROBERT W. REINICKE, appointed assistant vice-president in charge of manufacturing and engineering, Ekco Products Co., Chicago.

The Iron Age
FOUNDED 1855
Technical Articles

Wanted: BETTER MATERIALS for nuclear reactors

By George E. Evans
Senior Physicist
Technical Training Dept.
Oak Ridge National Laboratory
Oak Ridge, Tenn.

Reactors resemble huge heat exchangers and materials must have satisfactory physical and thermal properties. Titanium, zirconium and beryllium offer possibilities as construction materials. Bismuth, lead, sodium and potassium could be used as liquid metal coolants. Ceramics and ceramic-metallics offer unusual mechanical properties at high temperatures. Several new alloys are suggested.

Atomic reactors need better materials—materials with higher physical and nuclear properties, materials meeting standards of purity previously unknown in engineering experience. As a result of present and future research we may expect to see new engineering materials and a greater understanding of the properties of materials and the methods of materials production.

Selection of materials for construction of a nuclear reactor is extremely complicated by operating conditions which vary over a tremendous range of temperatures, pressures and electrical powers. One product of the chain reaction is heat which must be dissipated. Material specifications are similar to those for a heat exchanger operating at the same temperature and power. The present article is based on a paper presented at the Oak Ridge Summer Symposium.

Physical properties must be adequate. Thermal conductivities and heat transfer coefficients must be high. Thermal and hydraulic properties of the coolant fluid must be satisfactory. Thermal expansion coefficients of solid materials should be small or well matched. The rate of corrosion must be within acceptable limits. Solid materials must be capable of being formed or joined.

For a reactor to operate, materials of suitable nuclear characteristics must be arranged to permit a nuclear chain reaction to occur. Neutrons, most valuable material in the reactor, must be produced at least as rapidly as they are captured or lost. In selecting reactor materials nuclear constants are of great importance.

The requirement of neutron economy has introduced new standards of purity for existing materials. Common elements such as cadmium, boron, hafnium, silver, cobalt, and manganese have such high capture cross sections that even small amounts can markedly alter the nuclear properties of an alloy. Where an impurity must be held to a few parts per million, even a suitable method of analysis may present a research problem.

Careful control needed

Quantities of materials in the reactor core must be carefully controlled. The amounts of fuel material, moderator, coolant, and components determine the neutron, and heat, balance in the reactor, and cannot be independently varied. Volume of extraneous material can be reduced by developing alloys of improved mechanical performance.

All materials become radioactive upon extended exposure. Thus, maintenance or repair of components within the neutron shield becomes difficult. Advantage can be gained by use of materials whose induced radiations are weak and short-lived.

Use of new and old materials presents problems in corrosion resistance. Before a metal-

coolant combination can be used, it must be carefully checked in long-time dynamic tests, simulating operating conditions.

Interaction of nuclear radiations with materials of which the reactor is built causes changes in properties of affected materials. A 1 Mev neutron will transfer about 142,000 ev in an elastic collision with a carbon atom, or about 74,000 ev in an average collision with an aluminum atom. These energies are greater than the binding energies of atoms in a solid. The recoil atom will fly off through the lattice, knocking other atoms out of its way. Such collisions may in time alter the properties of a solid.

TABLE I

THERMAL NEUTRON ABSORPTION CROSS SECTIONS

Low		Melting Point Deg. C	Intermediate		Melting Point Deg. C	High	
Element	Cross Section		Element	Cross Section		Element	Cross Section
O	0.0016	.....	Zn	1.0	419	Mn	12
C	0 0045	.....	Nb	1.2	1950	W	18
Be	0.009	1350	Ba*	1.2	850	Ta	21
F	0.01	.....	Sr*	1.3	752	Cl	32
Bi	0 015	271	N	1.7	.....	Co	35
Mg	0.07	651	K	2.0	62	Ag	60
Si	0.1	.....	Ge	2.3	.....	Li	67
P	0.15	.....	Fe	2.4	.....	Au	95
Zr	0.18	1900	Mo	2.4	2620	Hf	100
Pb	0.18	327	Ga	2.8	30	Hg	340
Al	0.22	659	Cr	2.9	1615	Ir	470
H	0.32	.....	Tl	3.3	302	B	715
Ca*	0.42	810	Cu	3.6	1083	Cd	3000
Na	0.48	98	Ni	4.5	1452	Sm	8000
S	0.49	.....	Te	4.5	.....	Gd	36000
Sn	0.6	232	V	4.8	1720		
			Sb*	5.3	630		
			Ti	5.8	1800		

* Melting po'nts too high for use as coolant.

TABLE II

MODERATING RATIOS

Mass	Element	Slowing Down Power	Moderating Ratio
1	H	0.85	65
2	D	0.072	47,500
4	He	0.0123	.....
7	Li	0.024	0.0083
9	Be	0.146	133
11	B	0.071	0.00073
12	C	0.058	182
14	N	0.045	0.74
16	O	0.0215	316.
19	F	0.014	6.1

From the viewpoint of materials selection, the important factor is not over-all reactor power, but specific power in watts per cc or btu's per cu ft. Any high performance reactor must operate at high specific power. To produce any reactor product in large quantities a high neutron flux (many fissions per second) is needed.

Each fission liberates 200 Mev of heat energy. These huge quantities of heat can be dissipated by:

(1) Using physically large systems so that the rate of heat production per unit volume is small.

(2) By the use of highly efficient cooling systems.

(3) By operating at high temperatures, to take advantage of the better heat transfer across higher thermal gradients.

Very large reactors have cost and volume limitations. For mobile power reactor applications, size and weight limitations demand that heat be produced in a small volume. In any reactor, performance depends not only on the rate of production of neutrons but on the neutron flux. Greater concentrations of isotopes can be produced in a small, high flux reactor.

Requirements for rapid heat removal suggest use of liquid metal coolants, whose heat transfer coefficients and thermal conductivities are much better than those of water. In addition, a liquid metal system can operate at atmospheric pressure. This introduces new corrosion problems. Many metals showing good resistance to liquid metal corrosion have fairly poor nuclear properties. Thus, new alloys of improved properties must be developed, or reactors must be designed which can tolerate the materials available. The necessity of circulating heavy radioactive liquid metals introduces problems in pump design and power requirements. For power reactor operation, high temperatures are necessary to thermodynamic efficiency. Research on the properties of refractory metals is needed.

See wider use of ceramics

Operation at very high temperature suggests use of ceramic materials. Ceramics are known whose rupture strengths and creep strengths near 1000°C are higher than those of refractory alloys such as Inconel or Stellite, and which can be quenched from white heat to room temperature many times without cracking.

Although ceramics are generally thought of as insulating materials, good values can be obtained for thermal conductivity. The thermal conductivity of beryllium oxide at high temperatures is about the same as nickel and considerably better than stainless steel.

Ceramics have undergone a major revolution in the last decade. Major problems remain in developing ceramics of improved chemical and thermal shock resistance. Progress has been made in this direction by incorporation of small amounts of metals into the ceramic structure, producing a metal-ceramic of improved strength properties.

Some idea of potentially useful materials for construction of nuclear reactors may be gained from a study, Table I, of the neutron absorption cross section of the common elements. Reasonable amounts of elements in the first group might be included in a thermal reactor. Large amounts of elements in the second group could not be tolerated in a thermal reactor but might be acceptable in an intermediate reactor. Elements in the third group could be used in

any appreciable quantity only in a fast reactor.

No consideration has been given to the energies at which neutron absorption occurs, or to the volume a given mass of material would occupy. In addition to having a low cross section, a good moderator must be capable of rapidly reducing neutron energy, which requires low atomic weight.

Efficiency of moderation is given by the moderating ratio, the ratio of slowing down power to macroscopic capture cross section. In Table II values of the slowing down power and moderating ratio are given for a number of light elements. Hydrogen has the largest slowing down power but deuterium has a better moderating ratio because of its small capture cross section. Good moderators will be composed of elements such as deuterium, oxygen, carbon, beryllium, and hydrogen.

Other elements can be used

Other elements can be used for production of useful compounds provided they have small capture cross sections and allow a large atomic density of good moderating elements. Helium, deuterium, hydrogen, and oxygen can scarcely be obtained in sufficiently high density to be of interest, but potentially useful moderating materials, Table III, can be formed from these elements.

Heavy water has the best moderating ratio but is expensive. It can be used in relatively small reactors using natural uranium fuel. Other moderators on the list require either enriched fuel or relatively large systems. The low cost of ordinary water as a moderator is offset by the expense of enriched fuel.

Use of beryllium in the moderator is conditioned by the high price of reactor grade material. Use of organic compounds is uncertain because of the known radiation sensitivity of most organic materials. Those metals suitable for structural components are shown in Table I with their melting points.

Low melting metals as coolants

Metals of very high absorption cross section have not been considered. The alkaline earth metals and antimony have melting points too high for use as a liquid metal coolant. Poor mechanical properties and high chemical reactivity make them unpromising as structural materials. Any of the low melting point metals may be considered as possible coolants, and any of the high melting point metals as possible structural materials. Since high melting and low melting are relative terms an arbitrary division may be made at 500°C.

As a construction material beryllium metal appears promising, combining high melting point with a good moderating ratio. Full advantage cannot be taken of its high melting point because of its high sublimation pressure and it is chemically active and quite brittle. Aluminum and magnesium have relatively low melting points and the corrosion resistance of magnesium is relatively poor.

TABLE III

MODERATING MATERIALS

Beryllium metal	Water
Carbon (graphite)	Heavy Water
Beryllium oxide	Hydrocarbons
Beryllium carbide	Deuterocarbons

Organic Compounds $C_xH_yO_z$

Zirconium has only recently been produced in commercial quantities. Ductile zirconium metal can be produced by thermal decomposition of zirconium iodide, reduction of tetrachloride by magnesium (Kroll process), and reduction with calcium. The iodide process gives best purity and ductility.

Zirconium can be cold-rolled or swaged to over 95 pct reduction in area without intermediate annealing. Although known as an oxygen getter, the massive metal can be hot-worked in air at 600°C without danger of oxygen pick-up. Corrosion resistance is excellent, except to hydrofluoric acid, aqua regia, and hot concentrated sulfuric or phosphoric acids. It has excellent corrosion resistance to alkalies, and is unaffected by fused NaOH.

New alloys suggested

Several useful alloys suggest the possibility of adding small amounts of metals or nonmetals of lower melting points or higher cross sections if significant improvements in mechanical properties can be attained. For example, aluminum-magnesium, aluminum-silicon and aluminum-magnesium-silicon alloys are well known. Other possible combinations such as beryllium-magnesium, beryllium-aluminum, beryllium-zirconium, zirconium-aluminum and zirconium-tin are not so well known and require further study.

Many more metals are available if we accept a higher cross section. Niobium has good mechanical properties but is expensive. Chromium generally has poor ductility and shows little promise for use as a pure metal. Properties of iron or copper can be greatly improved by suitable alloy additions, so their use as pure metals is unlikely. Vanadium, a relatively rare metal, probably will remain too expensive except for use as an alloying element.

The list of pure (or nearly pure) metals of interest is reduced to molybdenum, nickel and titanium. Molybdenum, from its known uses in resistance furnace windings and vacuum tube filaments, appears a likely possibility for very high temperature use. Titanium as a commercial metal has already aroused considerable interest. Titanium is 20 times as abundant as copper, nickel, tin, lead, and molybdenum combined,

and is concentrated in large deposits for easy mining.

A wide range of properties is available in titanium alloys. The pure metal can be made very ductile, and can be cold-worked to a 99 pct reduction in area without edge cracking. At 50 pct reduction in area it has a tensile strength of 125,000 psi, with 12 pct elongation. High strength titanium alloys have the highest strength-to-weight ratio of any commercial alloy known. Corrosion resistance compares favorably with stainless steels.

The alloys which can be produced from this list of elements are too numerous for systematic listing. Among the iron-base alloys are a variety of stainless steels combining good corrosion resistance with good mechanical properties up to moderately high temperatures. Nickel and nickel alloys include Nichrome, Illium, Hastelloy, Monel and Inconel. Use of most brass or bronze alloys at high temperatures is questionable because of high creep rates.

Zirconium shows promise

Metals which appear most promising for reactor use include the refractory (or somewhat refractory) metals and alloys zirconium, molybdenum, titanium, stainless steels, nickel-base alloys such as Nichrome, Illium, Hastelloy, Monel and Inconel.

Of the metals which melt below 500°C, cross sections of bismuth and lead are quite good but melting points are fairly high. Tin offers little since its cross section is much higher and it is much more reactive chemically than bismuth or lead. Sodium has excellent thermal conductivity, low melting point, and low density, which means much more economical pumping.

Potassium, gallium, and thallium have high cross sections and are more expensive than metals already mentioned. Gallium is liquid at room temperature, but sodium-potassium alloys also can be liquid at room temperature, have lower cross-sections, and are cheaper.

Two, three element compounds

Most promising of the liquid metal coolants seem to be bismuth, lead, sodium, potassium, or combinations of these. Potentially useful compounds may be formed from elements of low cross section. Two-element compounds include oxides, carbides, fluorides, silicides, phosphides, hydrides and sulfides. Three-element compounds include carbonates, silicates, phosphates, hydroxides, sulfates, silico-fluorides, phosphonium derivatives and hydrosulfides.

Some of the low melting fluorides might make molten salt heat transfer fluids. The phosphides and sulphides seem uninteresting as materials of construction, usually being poor in mechanical and thermal properties. The hydrides suggest possible use as moderating materials depending upon mechanical and thermal stability.

None of the remaining materials show any interesting properties as structural materials, with the possible exception of the silicates, and various cements and concretes made from these. Of the phosphates and sulfates, the free acids, phosphoric and sulfuric acid are of interest as high-boiling heat transfer liquids; however, the 1950 **Chemical Engineers' Handbook** does not list any materials suitable for use as containers at high temperatures.

TABLE IV

CERAMIC MATERIALS

Oxides		Carbides	
Compound	Melting Point, Deg. C	Compound	Melting Point, Deg. C
BeO	2450	Be_2C	12100
MgO	2800		
SiO_2	1400–1700	SiC	2200
Al_2O_3	2050		
ZrO_2	2700	ZrC	
CaO	2570	CaC_2	2300
SnO_2	1127		

TABLE V

PROPERTIES OF A MODERN CERAMIC MATERIAL

Composition	Pct	Creep Rate, Pct per hr.	Temp, Deg. C	Stress psi.
BeO	84.2	3.0×10^{-4}	980	17,000
ZrO_2	8.6	16.2×10^{-4}	1040	15,000
Al_2O_3	7.2	12.7×10^{-4}	1150	6,000
CaO	2.0			
	102.0			

Thermal Conductivity: 0.55 w/(cm²) (°C/cm).

The only low cross section metallic hydroxide stable to heat is sodium hydroxide. Its relatively low melting point of 318°C suggests possible use as a fluid heat transfer medium. A number of suitable corrosion resistant containers, including stainless steels and nickel alloys, are available. The high melting oxides and carbides suggest useful ceramic materials. In Table IV, in order of cross section, are a number of oxides and carbides with their melting or softening points.

Beryllia, magnesia, silica, alumina, zirconia, lime, and Carborundum are widely used refractory materials. Useful ceramics are rarely pure compounds, so we must consider mixing these oxides or carbides in all possible proportions.

As an example of the sort of properties available in modern ceramics, National Advisory Committee for Aeronautics has reported strength and creep properties of a number of beryllia, zirconia, and alumina type ceramics. One of these, which in view of its high beryllium content and absence of neutron absorbers, might have possibilities as a moderator, is shown in Table V.

At temperatures near 1000°C, Inconel would

creep more than 100,000 times as fast at about one-third the applied stress. The ordinary stress-to-rupture test does not apply very well to these ceramics, since they apparently do not enter a third stage of creep. Instead, the creep rate continually decreases with increasing time at constant stress.

Thermal conductivity is about three times that of stainless steel. These ceramics were found extremely resistant to high temperature air or water vapor, and after 5-hr exposures to air plus water vapor at 930°C often increased in strength properties.

Even the best ceramic materials, however, are much poorer in ductility and thermal shock resistance than average metals. Ceramics showing most outstanding properties at very high temperatures are apt to be quite brittle at room temperature.

Bibliography

General Electric "Chart of the Nuclides."

"The Science and Engineering of Nuclear Power," Vol. I and II.

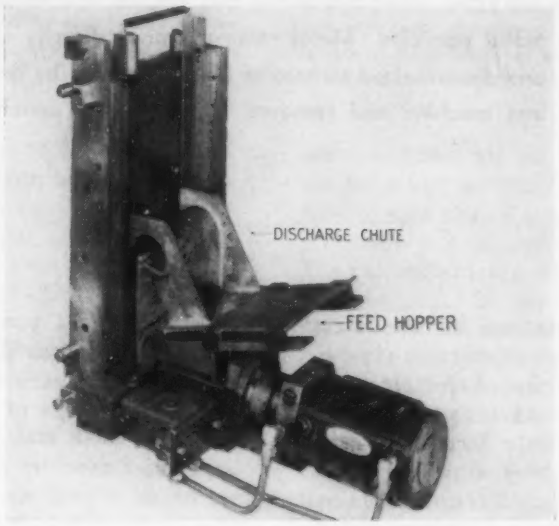
National Advisory Committee for Aeronautics, Technical Note 1561.

Norton, F. H., Journal American Ceramic Soc., 30, pp. 242-245, 1947.

Norton, F. H., MDDC-126, "Pure Beryllium Oxide as a Refractory."

Londerbee, J. W., AF-TR-6051, "Unclassified Metalloid-Metal Bodies."

Automatic fixture TRIPLES BROACH OUTPUT



AUTOMATIC fixture for loading and unloading vertical broach upped output from 1880 to 6000 parts per shift.

Development of an automatic fixture for a vertical broaching machine making an auto part tripled its output.

Automotive countershafts are produced from lengths of steel bar stock cut off on an automatic screw machine. The broaching operation consists of removing the screw machine cutoff projection and cutting a step in one end of the countershaft. It is done on a 4-ton, 18-in. stroke, vertical broaching machine. When fed manually this machine produced a maximum of 1880 pieces in an 8-hr shift.

When production requirements were materially increased, the question of additional broaching equipment was considered. Additional machines would have meant not only a major investment, but additional floor space which was not immediately available.

After consulting with National Broach & Machine Co. engineers, it was decided to develop an automatic fixture which would raise the productivity of the broaching machine already on hand sufficiently to meet the new requirements.

The result is the illustrated fixture, which increased production to 6000 pieces per shift. It also left the machine operator sufficient time to operate two automatic cutoff machines as well. For broaching, the operator only has to load parts from the cutoff machines into the feed chute of the fixture.

A ram operated by a 6-in. pneumatic cylinder and piston is synchronized with the action of the broaching machine. At each forward stroke it pushes two work parts from the feed chute into broaching position and holds them during the cutting stroke of the broach. As the broach returns, lifting dogs carry the broached parts upward and into the mouth of the discharge chute. They slide out of this chute by gravity into a bin or tote box.

The broaches operate at 25 fpm and are reground after producing 18,000 pieces. The coolant is 20:1 soluble oil.

Russians machine bearing balls

ELECTRO-MECHANICALLY

Translated by
Henry Brutcher
P. O. Box 157
Altadena, Calif.

Bearing balls are machined electromechanically at Russia's State Bearing Works. Balls roll between charged upper and lower disks. Lower disk rotates at 500 to 600 rpm. Microarcs soften ball surface and rotating disk throws off softened metal particles. Metal removal varies directly with voltage. Slightly pitted and decarburized surface of ball is removed by hard lapping. Balls can be fed into machine and removed automatically, permitting high production rates.

An electromechanical method of machining bearing balls has cut production time by two-thirds, substantially reduced electric power consumption, and effected savings in grinding accessories at Russia's State Bearing Works, according to a recently published paper.

The method, described in a Russian technical paper,* eliminates roughing, preliminary grinding, washing, soft abrasive treatment, sorting, soft lapping, and rubbing with filings. Eight to 9 days are needed to process 3000 balls by normal machining methods. With the new method production of bearing balls has been reduced by 5 to 6 days.

* Pankratov, N. A., Gofman, B. P., and Feldman, M. M., Promyshlennaya Energetika, 1950, No. 10, pp. 10-11.

The bearing ball, in this case 13/16 in. in diam, is rolled between one stationary and one rotating or between two rotating electrode disks insulated from each other, Fig. 1. A 25-v ac is passed through the upper disk. High current densities are produced at the points of contact between the work pieces and the disks. Due to relative displacement of the pieces with respect to the disks, many microarcs form at the points of contact. These soften the surface of the balls and the rapidly rotating disk throws off the softened metal particles.

By varying voltage and disk speed, it is possible to vary the rate of removal of metal. Pieces may be machined in a manner similar to normal roughing, coarse machining, fine machining and finishing operations.

To cool the balls and the disks, as well as to intensify the process, the working zone is flooded with water which also washes away the metal particles removed.

Principal parts of the machine are an upper stationary disk and a lower rotating disk. The upper disk consists of three mutually insulated segments, which are also insulated from the face plates on which they are mounted. The disk has a smooth surface, and balls are fed to the center of the disk through a hole 6 in. in diameter.

Current is applied to the top disk from a 3-phase transformer of the type employed for salt baths or electric furnaces. The secondary coil of the transformer delivers 20 to 25 v. Current intensity in the circuit under normal process conditions reaches 1200 to 1500 amp. Feed circuit for the upper disk is shown in Fig. 2. The lower disk has a smooth surface and is rotated at 500 to 600 rpm. Construction of the upper disk makes it possible to operate the machine without stopping for replacements or regrinding until the disk is worn out.

Steel most commonly used for making bearing balls is SH KH 15 which contains 0.95 to 1.1 pct C, 0.20 to 0.40 pct Mn, 0.15 to 0.35 pct Si, 0.20 pct S max., 0.27 pct P max., 0.20 pct Ni max., 1.30 to 1.65 pct Cr.

Balls of any size can be machined. To make possible the machining of large numbers of balls, the machine can be equipped with a conveyer-hoist contrivance.

Metal can be accurately removed from the ball at the rate of 0.006 to 0.008 in. per min

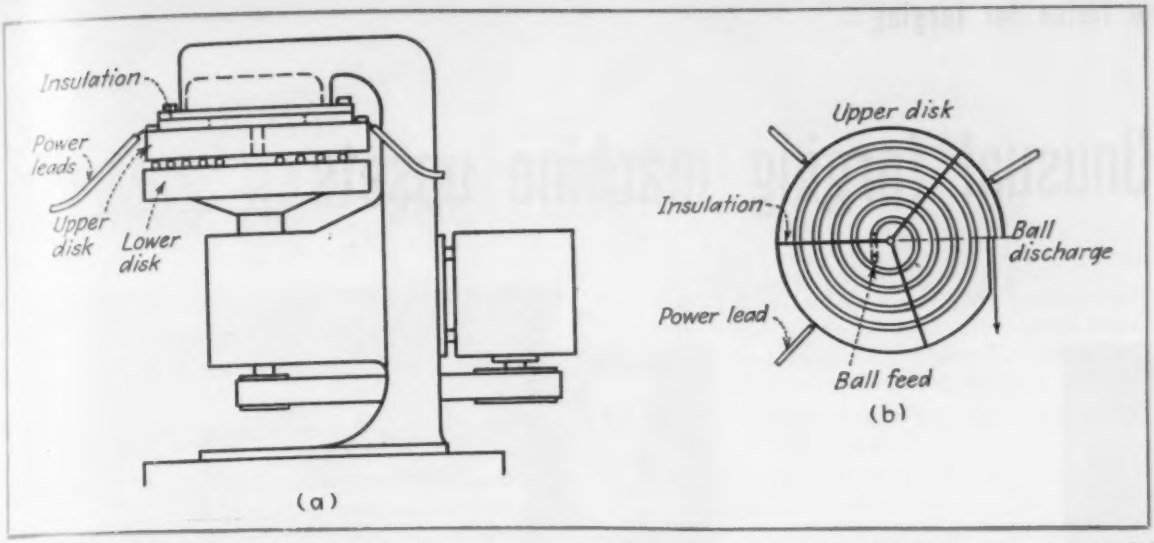


FIG. 1—Cross-section of machine shows bearing balls between upper and lower disks. Power leads are attached to upper disk which is insulated from machine frame.

FIG. 2—Balls are fed through hole at center of upper disk and work their way outward to discharge point. Upper disk is split in three insulated segments.

along the radius with an oval of 0.0004 to 0.0008 in. in the absence of differences in the size of balls being machined. This rate of removal of metal is attained at 15 to 20 v.

The surface of the balls show recesses from 0.0025 to 0.005 in. deep. If an allowance of 0.006 to 0.007 in. is made, these recesses can be eliminated by subsequent hard lapping. Lapping also removes the 0.0025 to 0.0040 in. decarburized layer.

If balls are machined at 7 to 12 v, depth of the holes and of the decarburized layer decreases in approximate proportion to the voltage, and a better surface finish is obtained. A decrease in voltage, however, also reduces the rate of removal of metal, which, at 7 to 12 v, is about 0.0025-0.004 in. per min. In cases where the balls are machined 0.5 to 5 v, the ball surface almost shows a polish. It is free from depressions and its spherical shape is excellent. The rate at which metal is removed varies from 0.000 to 0.0012 in. per min.

Power consumed by the electromechanical machining of bearing balls is 100 kw-hr in place of the 445.5 kw-hr previously consumed by the eliminated operations to process 3000 balls weighing 285 lb.

Upon full introduction of the method in the State Bearing Works, the annual savings in electric power are expected to amount to more than 2 million kw-hr. The method also reduces the wear of filing and grinding disks and wheels.

NEW BOOKS

"Some Applications of Atomic Energy in Plant Science." A survey of major activities in atomic energy programs from July to December, 1951, a condensed AEC financial report for 1951, and a description, Atomic Energy and Its Applications In Plant Science, are included in this volume. Supt. of Documents, U. S. Government Printing Office, Washington 25, D. C. 50¢. 211 p.

"Corrosion," by Frank N. Speller. Discusses corrosion and the electrochemical theory. A system of classification of corrosion phenomena and the principles of corrosion testing are presented. These principles are applied to corrosion prevention in the air, underwater, underground and in closed water and chemical systems. McGraw-Hill Book Co., Inc., 330 West 42nd St., New York 18, N. Y. $10.00. 664 p.

"Communication of Technical Information," by Robert M. Dederich. This book is written to aid executives in properly presenting technical information, and in getting information to those who need it and can use it. Stress is on thinking and logic which must underlie communication of technical information rather than proper grammar. Chemonomics, Inc., 400 Madison Ave., New York 17, N. Y. $5.00. 116 p.

"Company Preparation For Controls and the Defense Emergency," is a stenographic brief of addresses given before the personnel sections of the California Personnel Management Assn. and the Western Management Assn. California Personnel Management Assn., Farm Credit Bldg., Milvia and Center Sts., Berkeley 4, Calif. $1.00. 25 p.

New fields for forging—

Unusual forging machine upsets

STEPS in the forging process show a ⅜-in. bar 18 in. long, left. Upset forging, center, in which 11½ in. of the bar length have been gathered. One blow in a mechanical press brings the red hot "onion" to the shape shown at right.

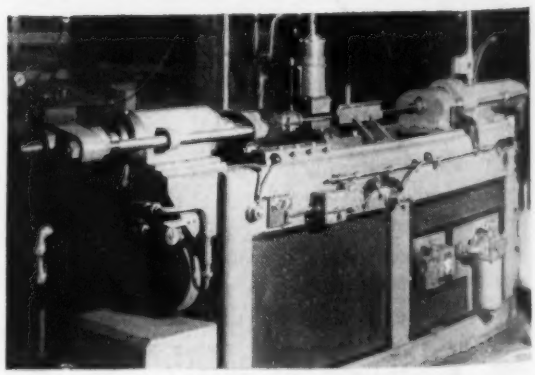
By Falih Darmara
Technical assistant to the president
Utica Drop Forge & Tool Corp.
Utica, N. Y.

Besides producing forging blanks for jet engine blades, this unusual machine also makes valve stems and other machine parts. It takes a ⅜-in. bar 18 in. long and upsets 11½ in. of it to form the base of a jet engine blade. It combines resistance heating with a hydraulic pushing ram and a moving anvil. Remarkably close control is achieved without dies. Production rates are as high as 600 pieces per hr, depending on stock size and amount of upset.

Electrical resistance upset forging machines are now upsetting as much as 40 to 50 diameters in aluminum, stainless steel and high temperature alloys. Production rates run as high as 600 pieces per hour, depending on stock size and the amount of material to be gathered.

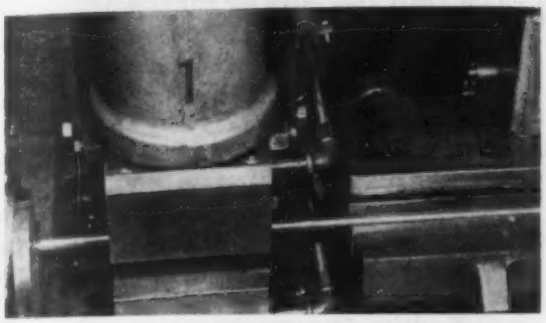
Two of these units at the Whitestown, N. Y., plant of Utica Drop Forge & Tool Corp. have been in production for several months on blanks for jet engine blades. The machines, built in England by Omes, Ltd., are now being made in Canada by Massey-Harris Co.

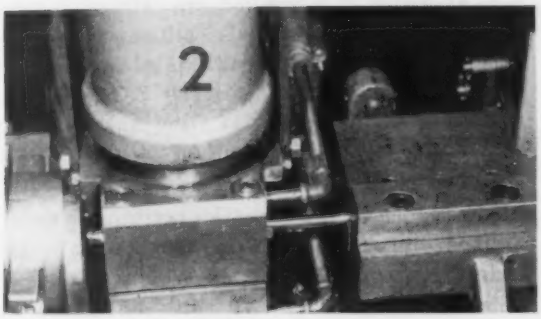
Another type of blank which the Omes machine can produce is that for a gear on a shaft. The gear can either be on the end of or in the

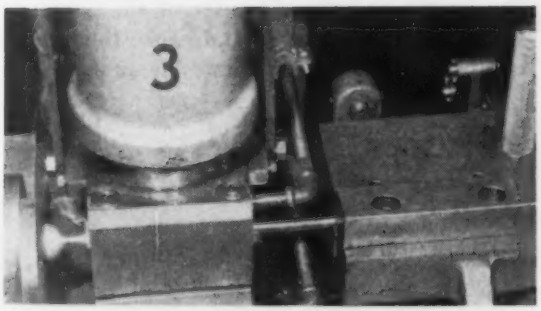


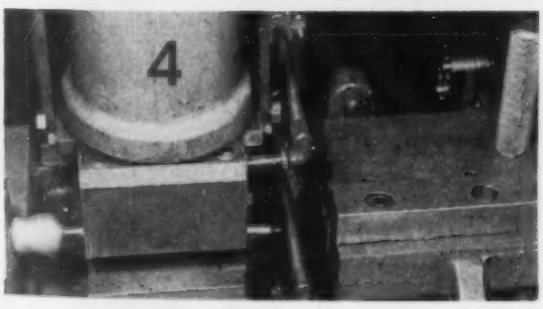
UPSET FORGING machine itself is relatively small, contains hydraulic and heating equipment and controls.

40 TIMES BAR DIAMETER







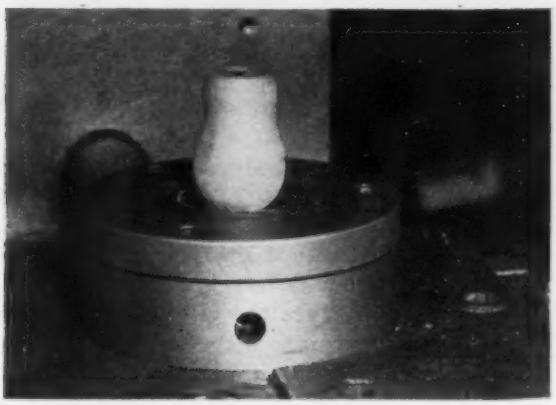


STAGES IN UPSETTING: (1) Bar is placed between clamp blocks and in guide (right) from which strip has been removed to show bar. (2) Upsetting starts with anvil (left) close to clamp blocks and with field between two heating bars. (3) Hydraulic cylinder at far right, not shown, has pushed bar against slowly retreating anvil as upsetting continues. (4) With upsetting completed, the right ram is withdrawn. The required shape has been formed in 6 sec.

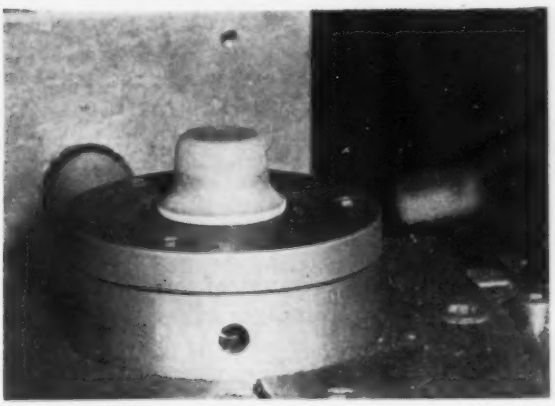
center of a relatively long shaft because of the ability to upset such a relatively large amount of stock. And, in spite of the difficulties usually involved in forging or die extruding high temperature alloys, these alloys can be handled very well by this process.

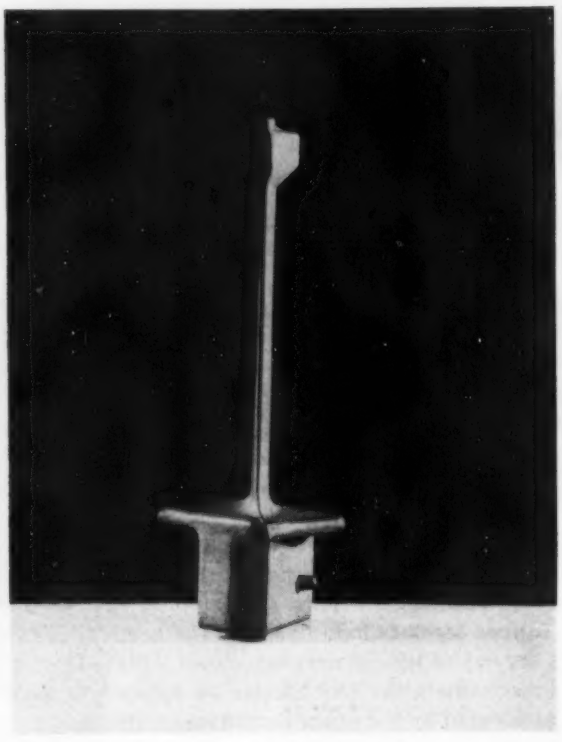
The Omes electrical upset forging machine is a self-contained unit about the size of a small plastic injection molding machine (some 3x10 ft by 4 ft high). It has two horizontal hydraulic cylinders and a vertical (clamping) hydraulic cylinder. One horizontal cylinder pushes the stock through a pair of clamping blocks. The upper block is held down by the vertical clamping cylinder. Emerging from this clamping mechanism the stock butts up against an anvil operated by the other horizontal cylinder.

An electrical resistance potential is set up between the water-cooled copper anvil and the



HOT PREFORM is dropped into press die after it comes from upsetting machine. Press blow gives it shape shown below preparing it for subsequent press and hammer forging.





EDGE-ON view of completed blade forging shows reason for upset forging. Note the amount of material gathered into the base and the thin blade flattened from ⅜-in. bar.

clamping blocks. This heats the end of the bar between the clamping blocks and the anvil—the part which is to be upset. This is the only part of the forging stock that *is* heated.

In the operation illustrated on these pages the end product is a blank for subsequent hammer forging and machining into a jet engine blade. Stock is ⅜-in. diam type 431 hot-rolled stainless steel, centerless ground. Surface is very important, hence the grinding. The upset portion is machined to make the dovetail that holds the blade in the wheel, the remainder of the bar is forged flat to make the blade itself.

Less machining needed

Key to the process is in correct balance and adjustment of these three elements: (1) The place where the bar is heated and the amount of heat applied; (2) Speed of the plunger that pushes stock against the anvil, and (3) The rate at which this latter anvil is retracted. (If it retreats almost as fast as the pusher ram the diameter of the upset material will be only a little larger than that of the bar stock; as its speed is decreased in ratio to the speed of the pushing ram the diameter of the upset area increases).

Aside from the amount of material that can be upset, other advantages so far demonstrated include: (1) Less machining on shafts; (2) ability to secure flow lines more or less perpendicular to the direction of maximum stress; (3) exposure of flaws in the stock, and (4) no dies are needed.

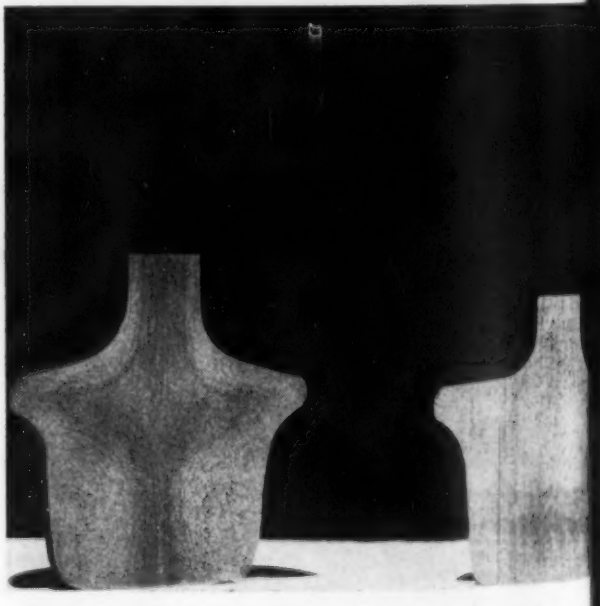
Shaft machining time is reduced because only the upset area is heated. The remainder of the bar is relatively cool; a few inches away from the heated end the bar is almost at room temperature. Since there is no scaling, the centerless ground bar stock requires no further grinding on the shaft area after the end is upset.

By the very nature of the process the material flows longitudinally. In other words, flow lines run in the same direction as the centrifugal force exerted on the blade in service.

Heat is critical factor

Any rolling defects, pits or inclusions in the stock are easy to spot on the surface of the upset area so the part can immediately be scrapped. Of course, the method is not without its difficulties. The amount of heat used and the rate at which it is applied are critical. It takes time to work out the ideal combination for each type of part. Using type 431 stainless, the upset area is heated to 1800° to 2000°F. Less heat is needed on mild steel; S 816 alloy must be run up to 2100° to 2150°F. Aluminum will upset satisfactorily at 800°F.

The vertical hydraulic cylinder merely clamps, but the speeds of the horizontal cylinders have to be adjusted carefully. As indicated above, the relative speeds of these two cylinders (plus temperature) determine both the length and the diameter of the upset. But once these factors are established the machine can be set to go through its cycle automatically.



FLOW LINES in upset forging, left, contrast with normal structure of a machined piece, right. "Dirty" steel was selected for these sections to show flow more clearly.

New construction method favors LIGHT STEEL FRAMING

Wider use of light steel building frames is possible with a lightweight fire-proofing construction developed by the Gypsum Assn. The method eliminates much dead load and, costwise, improves the position of light steel framing with respect to reinforced concrete.

Based on calculations for a 12-story building, light steel framing showed savings of 15 pct over the most economical of four heavier construction methods, the assomiation claims. Savings up to 14 pct of the steel used in conventional steel frames are believed possible.

Buildings can be designed to meet all requirements for structural strength and fire protection. Greater use of prefabricated materials can be made and construction methods can be speeded.

Structural elements of the light steel frame are fire-proofed with gypsum lath and lightweight aggregate gypsum plaster. Steel columns are wrapped with one or two layers of gypsum lath, Fig. 1, held in place by tie wires. These are plastered to the thickness meeting the required fire-resistive rating.

These clips engage the furring channel at one edge of the lath. The opposite end of the wire clip, Fig. 1, passes through the eyelet of the preceding clip, thus giving continuous support to the lath under the channel.

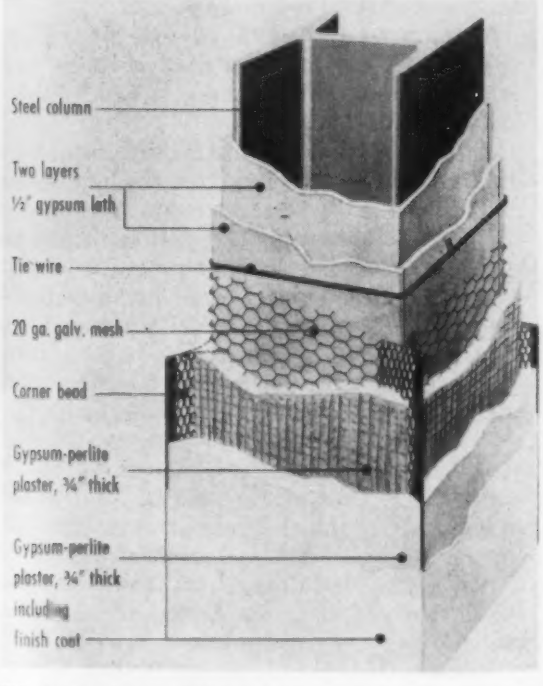


FIG. 1—Two layers of ½-in. plain gypsum lath, chicken wire mesh, two ¾-in. thickness of gypsum perlite plaster add up to a total of 4½ hr fire resistance.

FIG. 2—Opposite end of wire clip passes through eyelet of preceding clip, gives continuous support to lath.

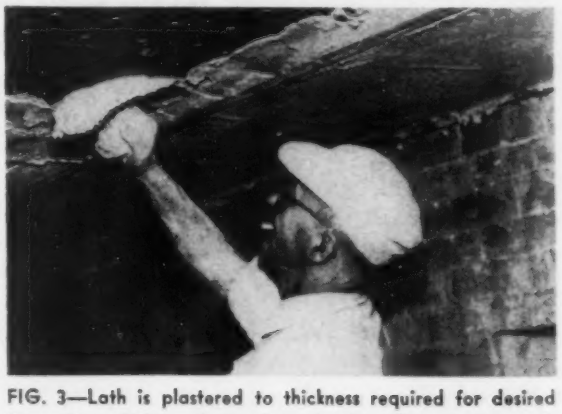


FIG. 3—Lath is plastered to thickness required for desired fire rating. When plastered, projecting clips are covered.

The lath is plastered, Fig. 1, to the thickness required for the desired fire-resistive rating. If girder beams project below the ceiling line, the exposed portion is furred in the conventional manner with gypsum lath for plastering.

A 2-in. solid gypsum lath and plaster partition is also used. These consist of ½ in. gypsum lath in lengths extending from floor to ceiling. The lath is centered in a metal floor runner assembly. It is secured at the ceiling in concealed runners or tie-wired to a special metal strip. To provide temporary rigidity for plastering, ¾ in. cold-rolled channels are used longitudinally.

The partitions weigh about 12 lb per sq ft compared to about 40 lb per sq ft for conventional masonry partitions. In buildings having small cubicles the 2 in. partitions may save up to 8 pct in floor area.

A fine case of balance—

Automatic balancing makes CONNECTING RODS INTERCHANGEABLE

By W. G. Patton
Asst. Technical Editor

Automatic machines at DeSoto balance connecting rods so accurately that 100-pct interchangeability is attained. Weight is held within ± 2 grams. Machine weighs each end of rod about the center of gravity, transmits information which sets milling cutters to remove proper amount of metal. Standard design milling heads are used.

Weight of the interchangeable connecting rods used on the new De Soto V-8 engine is held within plus or minus 2 grams by a Motch & Merryweather balancing machine. By predetermining the center of gravity and weighing each end of the rod, then balancing each end to the correct weight, 100-pct interchangeability is attained.

The machine weighs simultaneously both the crankshaft bearing end and the wrist pin end on a Toledo scale. Indications that the connecting rod is overweight are transmitted to milling machines which are thus set automatically to remove just the right amount of metal from each end of the rod.

A Toledo scale is designed to weigh each end of the rod about a fixed center of gravity, independently of the opposite end.

As the rod is being weighed, each end of the rod depresses a small amount. This is indicated in grams on the direct reading scale. The depression of certain mechanisms by the rod weight causes a selsyn transmitter in the scales to turn a few degrees. This, in turn, rotates a selsyn receiver in the milling machine the same amount. The setting of the milling quill is accomplished through the selsyns.

As soon as the scale is firmly settled or has reached a fixed position, a light flashes off and the machine can be operated.

This operation is performed at De Soto at a rate of 240 pieces per hr at 100-pct efficiency. Maximum amount of metal removed from the crankshaft bearing end of the part is 20 g. Maximum amount of metal removed from the wrist pin end of the part is 35 g. Average amount of metal removed is 10 to 15 g from each end of the connecting rod.

If the wrist pin end of the rod is within the specifications, no metal is removed. Some metal is always removed from the crankshaft bearing end of the rod.

The operation at De Soto is performed on two different machines: The first machine weighs and automatically removes metal from one side of the wrist pin boss. The part is then transferred to a second machine where it is again weighed and machined. In this second operation, the remaining amount of metal is removed from the wrist pin boss. The correct amount of metal is also taken off a pad provided on the crankshaft bearing end of the forged steel part.

To start the machining cycle, the operator places an overweight connecting rod on the scale. Each end of the rod is individually weighed about the fixed center of gravity. The amount of overweight is mechanically transmitted to the machining unit. The connecting rod is then placed in the fixture of the milling machine and the cycle button is pressed.

A hollow mill is used to remove one-half the required amount of metal from the wrist pin end of the part on the first machine. After the machine is loaded, the table indexes 180°. The

milling head feeds in automatically, removing the correct amount of metal, and then returning automatically to starting position.

The second machining unit is provided with a milling head to remove metal from the wrist pin boss. It is also equipped with a special quill type traveling milling machine head for removing metal from the crankshaft bearing end of the connecting rod.

Following the first milling operation, the part is again weighed and loaded on a fixture consisting of two pins and a clamp. The milling cutter moves in at the pin end of the machine, removing the amount of metal indicated by the weighing operation. This part of the machine operates in a manner similar to the initial milling operation.

Simultaneously, at the crankshaft bearing end of the machine, the locating probe and quill of the milling head advance toward the pad end of the rod. The locating probe stops against the pad. The milling head advances the additional distance required to remove just enough metal to bring the connecting rod end of the part within the required weight balance.

At this point, the milling head quill is locked. The milling slide is rapid traversed and then fed at the proper milling rate to remove the extra stock. Milling quill and probe retract, head returns to starting position, jaws unclamp.

During the machining cycle the operator places the next overweight rod on the scale unit. The correct weight data is transmitted from the scale unit to the milling head where positive mechanical stops are positioned and held until the operator unloads the completed rod. The operator then places the next overweight rod in the machine and presses the cycle button.

The hydraulically-actuated clamping fixture is a simple direct-action type. The entire unit is mounted on a heavy, welded steel base. The Toledo scale unit of both machines is contained in a floor-mounted cabinet, positioned at right angles to the machine. This brings the entire machine within easy reach of the operator.

The steel presently specified is MS 308. Milling cutters used are the carbide insert type. Presetting of the machines is accomplished through a combination of electronic, mechanical and hydraulic controls. Milling heads are standard design.

In order to maintain the required output of its new V-8 engines, De Soto is operating two machines for the first weighing and milling operation and three additional machines for the second operation.

AUTOMATIC BALANCING machine used on DeSoto connecting rods is so accurate rods are interchangeable. Unit at right does weighing, transmits information which automatically sets milling cutters on unit at left.

Longer life for tool steels—

MANUFACTURE and USE OF GRAPHITIC TOOL STEELS show vast progress

Part II

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Galling tests comparing Graph-Mo with other tool steels show that Graph-Mo will take almost twice the load without galling. Structural stability of the graphitic steels are excellent as shown by tests over many years in a wide range of applications.

Of the various type testing equipment available the Amsler wear test is best suited to stimulate draw die service performance conditions. The important features of this type test are that the rubbing speeds are low, the unit loads high, and the test is made at approximately 70°F. The Amsler wear test simply rubs the periphery of discs prepared from tool steel materials to be tested against soft SAE 1015 steel. Pressures and speeds of the test materials were increased until galling occurs.

The steels wear tested are given in Table IV. The galling test results are shown in Table V. It can be seen from these results that Graph-Mo withstood about twice the load of the regular die steels without galling.

Static coefficient of friction tests have also been made on Graph-Mo in comparison with several other types of tool steels, all finished to the same degree of surface finish, Fig. 10. The lower coefficient of friction of Graph-Mo under all conditions of heat treatment is due to the graphite particles present at the immediate rubbing surfaces in the graphitic steels, irrespective of the condition of heat treatment.

Structural stability tests have been run over a period of years on master gages in Timkens Bearing Plant. These gages were quenched and tempered to Rc 60 to 63. Two groups, A-1 and B-1, were stabilized at +15°F; the other, A-2

TABLE IV

STEELS WEAR TESTED

	SAE 1015	Oil Hardening Die Steel	Graph-Mo
Chemical Analysis:			
Carbon	0.11	0.92	1.49*
Manganese	0.40	1.11	0.40
Silicon	0.17	0.14	0.86
Chromium	0.05	0.46	0.16
Nickel	0.12	0.09	0.14
Molybdenum	0.02	0.02	0.24
Vanadium	....	0.20	....
Tungsten	....	0.61	....
Graphite	....	....	0.69
Hardening	None	1450°F**	1480°F**
Tempering	None	300°F	300°F
Hardness, Brinell	90	....	....
Rockwell C	....	62.5 to 63.5	61.0

* Includes the 0.69 graphitic carbon.
** Oil quenched.

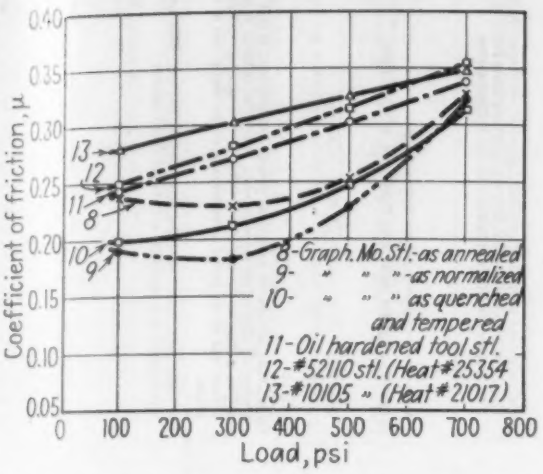

FIG. 10—Static coefficient of friction for several tool steels. These data are on dry friction tests.

and B-2, not stabilized. The complete heat treatments applied on these test plugs are shown in Table VI. The size change that occurred over a period of 11 years, Table VII, clearly shows the marked stability of the steel. The somewhat greater size change of plug No. 6 B-1 is believed due to retained austenite as a result of the 1525°F quench and 300°F draw temperatures. Present practice for stabilization requires three

(Text continued on page 110)

TABLE V

GALLING TEST RESULTS

Die Steel and Test No.		Galling Load 213 R.P.M.	Galling Load 426 R.P.M.
Graph-Mo	1	160 kg.	.....
	3	+200*	80–80**
	4	+200*	100
	6	+200*	40–80**
Regular	2	140	.....
	5	120–140**	.....
	7	80–100**	.....
	8	120	.....

* Did not gall at 200 kg. at low speed.
** Galled while increasing from lower to upper load noted.

TABLE VI

HEAT TREATMENT OF GRAPH-MO TEST PLUGS

Group A-1
1475°F—Oil Quench—Temper 300°F—2 Hrs.
Regular stabilize.

Group A-2
1475°F—Oil Quench—Temper 300°F—2 Hrs.
Temper 400°F—12 Hrs.

Group B-1
1525°F—Oil Quench—Temper 300°F—2 Hrs.
Regular stabilize.

Group B-2
1525°F—Oil Quench—Temper 300°F—2 Hrs.
Temper 400°F—12 Hrs.

TABLE VII

SIZE READINGS ON TEST PLUGS FROM 1940 TO 1951
1.750 IN. GRAPH-MO STEEL TEST PLUGS

Date Checked	No. 1—A1 Size, in.	No. 1—A1 Hollow or Taper Out of Rd., in.	No. 2—A2 Size, in.	No. 2—A2 Hollow or Taper Out of Rd., in.	No. 3—A2 Size, in.	No. 3—A2 Hollow or Taper Out of Rd., in.	No. 4—B2 Size, in.	No. 4—B2 Hollow or Taper Out of Rd., in.	No. 5—B2 Size, in.	No. 5—B2 Hollow or Taper Out of Rd., in.	No. 6—B1 Size, in.	No. 6—B1 Hollow or Taper Out of Rd., in.
6-17-40	1.74024	0.00001 0.00001	Not Cleaned Up—Reground		1.74891	0.00001 0.00000	Not Cleaned Up—Reground		1.73616	0.00002 0.00000	1.74489	0.00002 0.00000
7-18-40	1.74025	0.00001 0.00001	1.73996	0.00001 0.00002	1.74891	0.00002 0.00000	1.7442	0.00001 0.00001	1.73617	0.00002 0.00001	1.74495	0.00002 0.00000
12-8-40	1.74025	0.00001 0.00000	1.73994	0.00001 0.00001	1.74892	0.00002 0.00002	1.7442	0.00001 0.00002	1.736175	0.00002 0.00001	1.744925	0.00002 0.00000
3-5-41	1.74024	0.00001 0.00000	1.73994	0.00001 0.00000	1.74891	0.00002 0.00001	1.7442	0.00001 0.00002	1.73615	0.00002 0.00001	1.74495	0.00002 0.00001
5-23-41	1.74025	0.00001 0.00000	1.73995	0.00001 0.00001	1.74891	0.00001 0.00001	1.7442	0.00002 0.00002	1.73616	0.00002 0.00001	1.74494	0.00002 0.00001
4-5-42	1.740258	0.00002 0.000008	1.73998	0.000015 0.00002	1.74890	0.00001 0.000012	1.74419	0.00002 0.000015	1.736165	0.000015 0.000015	1.744955	0.000012 0.000005
5-13-43	1.74030	0.00001 0.00000	1.73994	0.00002 0.00001	1.7489	0.00001 0.00001	1.7442	0.00002 0.00001	1.73615	0.00002 0.000015	1.74495	0.00003 0.00001
11-3-43	1.740285	0.00001 0.00000	1.73997	0.000015 0.00001	1.74892	0.00001 0.00001	1.7442	0.00001 0.000025	1.736175	0.000015 0.000015	1.74498	0.00002 0.00001
8-7-44	1.74029	0.00001 0.00000	1.73996	0.00001 0.00001	1.74892	0.00001 0.00000	1.74421	0.00002 0.00002	1.73618	0.00001 0.00001	1.74498	0.00002 0.00001
12-22-45	1.74030	0.00001	1.73995	0.00001 0.00001	1.74892	0.00001 0.00000	1.74421	0.00002 0.00002	1.73617	0.00001 0.00001	1.74498	0.00002 0.00001
6-3-48	1.74031	0.00001 0.00000	1.73997	0.00001 0.00001	1.74892	0.00001 0.00000	1.7442	0.00002 0.00002	1.73617	0.00001 0.00001	1.74501	0.00002 0.00001
11-5-51	1.74031	0.00002 0.00001	1.73995	0.00001 0.00001	1.74892	0.00001 0.00001	1.7442	0.00002 0.00002	1.73616	0.00001 0.00001	1.74502	0.00002 0.00001
Change from 6-17-40 to 11-5-51	+0.00007	0.00001	0.00001*	0.00001*	0.00001	0.00000	0.00000*	0.00001*	0.00000	0.00001	0.00013	0.00001

* From 7-18-40.

Graphitic tool steels (continued)

TABLE VIII

GRAPHITIC TOOL STEEL APPLICATIONS IN STEEL MILL

APPLICATION	TYPE OF TOOL STEEL	HEAT TREATMENT	HARDNESS	SERVICE LIFE OF GRAPHITIC STEEL	TYPE STEEL REPLACED	SERVICE LIFE OF TYPE REPLACED	REMARKS
ROLLING MILLS							
Liners for Bloom Shears	Graph-Mo	1500° F. Quench in still oil. Temper at 300 to 400° F.	58 to 62 Rc	Indefinite	.....	.....	Liners operate in contact with brass or Graph-Mo with good service performance.
Liners for Rolling Mill Housings	Graph-Mo	1475° F. Quench in still oil. Temper at 300 to 1200° F.	40 to 63 Rc	2 Years	Soft Steel	.....	Liners installed at highest possible hardness. However, length, shape and installation of the liners may require lower hardnesses.
Roller Twist Guides for 16 in. Mill	Graph-Mo	1650° F. Air cool. Temper at 900° F.	275 to 302 Bhn	More than 63,692 tons have been rolled	Cast Metal	300 Tons	The guides are exposed to the hot rolled product and a water spray. Scratching of rolled product is negligible.
Shear Blade for 10 in. Mill	Graph-Mo	1500° F. Oil quench. Temper at 900° F.	60 to 62 Rc	Excellent	1 pct C Water Hardening	Short	The 1 pct C blades chipped and were reground often. Chipping of Graph-Mo blades was negligible.
Tong Bushing for Soaking Pit Cranes	Graph-Mo	1700° F. Air cool. Temper a 900° F.	230 to 250 Bhn	Excellent	Bronze	Short	The bushings cannot be lubricated. Graph-Mo did not wear an l extrude in the manner of bronze bushings.
TUBE MILLS							
Bar Ends for Reeler, Piercer, and Return Mill	Graph-Mo	1500° F. Oil quench. Threads remain soft on special fixture. Temper at 700° F.	48 to 52 Rc	2 Years	Oil and Water Hardening	Short	Oil and water hardening steels chip and break whereas Graph-Mo finally wears out.
Wear Plates for Tube Mill Bearing Cradles	Graph-Mo	1475° F. Quench in still oil. Temper at 300 to 1200° F.	40 to 63 Rc	Few months to several years	Soft Steel or Welded	.....	Plates installed at highest possible hardness. However, length, shape and installation of the plates may require lower hardnesses. The best service life is obtained with the hardest plates.
FORGE SHOP							
Piston Rings for Steam Hammers	Graph-Mo	(1) Normalize and anneal or (2) Normalize, anneal, normalize and temper at 900° F.	230 to 250 Bhn	Five times longer than cast iron	Cast Iron	Short (Fast Wear and Breakage)	Graph-Mo rings are cold rolled from 5/8 in. or 3/4 in. bars.
Feed Mechanism for Scarfing Tool	Graph-Tung	1525° F. Oil quench. Temper at 300° F.	52 Rc	6 Months	Oil Hardening	1 Month	.....
Pistons for Chipping Hammers	Graph-Tung	1450° F. Quench in brine at 120° F. Temper at 300 to 350° F.	63 to 65 Rc	18 Months	S.A.E. 52100 or 1 pct C Water Hardening	1 Month	Graph-Tung pistons are centerless ground and tempered at 300° F. Chromium plating not recommended. Vibration reduced with a 1 1/4 in. radius on the end of the chisel and by making the chisel contact end of the piston perpendicular to the center line of the piston.
Pulleys for Swing Grinders	Graph-Tung	1525° F. Quench in circulating oil spray. Temper at 400° F.	58 to 62 Rc	Better than 3 years	Cast Steel or Cast Iron	1 Month (Rapid Wear)	The belts wore rapidly with cast steel or iron pulleys. Belt wear was reduced to a minimum with Graph-Tung pulleys.
Safety Pin for Billeteer	Graph-Mo	1500° F. Oil quench. Temper at 700° F.	48 to 52 Rc	Excellent	.....	.....	.....
Safety Pin Bushing for Billeteer	Graph-Mo	1500° F. Oil quench. Temper at 400 to 500° F. for 3 hr.	58 to 60 Rc	Good	.....	.....	.....
Wear Plates for Billeteers	Graph-Mo	1500° F. Quench vertically into still oil. Temper at 300° F.	60 to 63 Rc	5 to 6 Years or Better	Meehanite or Soft Cast Iron	Short	The beds of the billeteers were originally made of cast iron which wore rapidly. Remachining the beds and inserting hardened, ground, Graph-Mo plates, 24 in. to 36 in. long reduced wear and cutting on the sliding surfaces.
FINISHING DEPARTMENT							
Cold Draw Dies	Graph-Tung	1475° F. (Do not preheat or soak.) Brine quench through the hole. Do not remove	68 to 70 Rc	16,000 Feet	Oil and Water	1,000 Feet	Graph-Tung dies are retreated after being worn oversize. The hole is shrunk sufficiently by reworking the distance between the

Wear Plates for Billeteers	Graph-Mo	1500° F. Quench vertically into still oil. Temper at 300° F.	60 to 63 Rc	5 to 6 Years or Better	Mechanite or Soft Cast Iron	Short	The beds of the billeteers were originally made of cast iron and wore rapidly. Remachining the beds and inserting hardened, ground, Graph-Mo plates, 24 in. to 30 in. long reduced wear and cutting on the sliding surfaces.

FINISHING DEPARTMENT

Cold Draw Dies	Graph-Tung	1475° F. (Do not preheat or soak.) Brine quench through the hole. Do not remove from fixture until die has cooled to brine temperature of 120° F. Do not temper.	68 to 70 Rc	18,000 Feet	Oil and Water Hardening	1,000 Feet	Graph-Tung dies are retreated after being worn oversize. The hole is shrunk sufficiently by governing the distance between the gasket and hole during quenching. Proper design of the die angle and a good drawing compound correctly applied, are important. Do not chromium plate. Carbide dies used on high production jobs.
Dies for Cracker Cutter	Graph-Mo	1500° F. Oil quench. Temper at 750° F.	50 to 52 Rc	9 to 12 Months	1 pct C Water Hardening	2 Weeks	Shallow hardening steels spall badly in this application.
Dies for Large Hot Pointer	Graph-Mo	1500° F. Oil quench. Temper at 700° F.	45 to 52 Rc	1 Year	S.A.E. 4340, 3140, 1060 and 1070 and Hot Work Steels	Few Days to 1 Month	The dies point hot tubes prior to cold drawing and are water sprayed after each tube is pointed. Steels other than Graph-Mo crack or wear very rapidly.
Dies for Small Hot Pointer	Graph-Mo	1500° F. Oil quench. Temper at 400° F.	59 to 62 Rc	1 Year	S.A.E. 4340, 3140, 1060 and 1070	Short	Materials other than Graph-Mo wore fast and heat checked.
Feed Clutch Parts for Rotoroll	Graph-Mo	1500° F. Oil quench. Temper at 400° F.	59 to 62 Rc	Very Good	Soft Steel	Short	The clutch similar to an automotive free wheeling clutch, consists of an outer race, rollers, inner cam, and inserts which are all made of Graph-Mo. The original parts Brinelled and wore rapidly.
Feed Rolls for Brightman	Graph-Mo	1500 to 1525° F. Oil quench in a spray. Temper at 300° F. for 5 hr.	60 to 63 Rc	4 Years	1 pct C Water Hardening	.....	The water hardening steel rolls failed due to breakage of the teeth whereas the Graph-Mo rolls gradually wear out.
Mandrels for Rotoroll	Graph-Mns	Threads wrapped with asbestos. 1500° F. (Hang in furnace on support on rails, ⅓ the distance from each end. Roll occasionally during heating.) Oil quench vertically. Keep threads above the oil. Temper at 600° F. Hang in air furnace.	54 to 57 Rc	50,000 Feet	Air and Oil Hardening and Carburizing Grades	5 pct Cr, 1 pct Mo, 1 pct C Gave 25,000 Feet	After hardening Graph-Mns mandrels are ground and tempered at 400° F. After each run in service, the mandrels are tempered at 400° F. to relieve any possible cold work.
Outlet Tubes for Rotoroll	Graph-Mo	1500° F. Oil quench in a spray until cold. Temper at 300° F.	60 to 63 Rc	Very Long	Oil and Water Hardening and Carburizing Grades	.....	The finished rotorolled tube passes through the outlet tube which, on all steels except Graph-Mo, picked up metal and scratched the finished product.
Rolls for McKay Seven-Roll Flat Straightener	Graph-Mo	Bearing ends of the shafts protected with asbestos. 1500° F. Oil quench in spray until cold. Double temper at 300° F., 5 hr. each temper	60 to 63 Rc	5 Years	.....	.....	It was not necessary to redress the rolls during their five-year service life.
Rolls for Medart Straightener	Graph-Mo	1500° F. Oil quench in spray until cold. Double temper at 300° F.,12 hr. each temper.	60 to 63 Rc	8 Months	S.A.E. 4340 and 52100	1 Month	The rolls are hollow and are made in various sizes. All are made from Graph-Mo and do not pit during service as did the 4340 and 52100 rolls. To avoid roll slippage on the product, the proper size rolls should be run together.
Rolls for the Outer Race of Hot and Cold Pointers	Graph-Mo	1460 to 1475° F. Quench in brine at 120° F. Temper at 400° F.	60 to 62 Rc	6 Months	1 pct C Water Hardening	1 Month	After heat treatment, the pointer rolls are ground and tempered at 300° F. The depth of the hardened zone is ¾ in. by this type heat treatment.
Rolls for Roller Leveler	Graph-Mo	1500° F. Oil quench in spray. Temper at 350° F.	59 to 61 Rc	20 Times Longer Than Cast Iron	Cast Iron	Short	The rolls are overhung and are produced 8 to a set. The cast iron rolls showed excessive wear.
Rolls for Sutton or 5-Roll Straightener	Graph-Mo	1500° F. Oil quench in spray until cold. Double temper at 300° F., 12 hr. each temper.	60 to 63 Rc	In Process	.....	.....	The rolls are ground after heat treatment.
Sectional Cold Draw Dies	Graph-Tung	1475° F. Quench in brine at 120° F. Temper 300 to 500° F. as desired.	60 to 65 Rc	Indefinite	.....	.....	The hardness is regulated according to the thickness of the die sections.
Track Rails for Rotoroll	Graph-Mo	1500° F. Oil quench vertically. Temper at 400° F.	59 to 62 Rc	Several Months	Soft Steel	Short	The head of the rotoroll slides or rolls on the rails which are 4 in. x 6 in. x 4 ft. long. The rails are tempered after grinding.
Track Rollers for Rotoroll	Graph-Mo	1500° F. Oil quench. Temper at 300° F. in air furnace.	60 to 62 Rc	1½ to 2 Years	S.A.E. 4340 Rollers or Bronze Shoes	Short	The 4340 rollers spalled badly in service.
Tube Drawing Mandrels for Cold Draw Bench	Graph-Al	1475° F. Brine quench. Stick mandrels to within ¾ in. of the thread and shell mandrels on a fixture that quenches only the O.D. Temper at 550° F.	58 to 59 Rc	Long (Only Minor Breakage)	1 pct C Water Hardening	Short Life Due to Excessive Breakage	The Graph-Al mandrels are ground, chromium plated to 0.0015 in. thickness on the diameter and tempered at 350° F. for 8 hr. to expel hydrogen. The mandrel should project through the die a sufficient distance to prevent stress concentration and breakage. The threaded portion of the mandrel and the working end should be the same size to facilitate centerless grinding.

Table VIII (cont.)

APPLICATION	TYPE OF TOOL STEEL	HEAT TREATMENT	HARDNESS	SERVICE LIFE OF GRAPHITIC STEEL	TYPE STEEL REPLACED	SERVICE LIFE OF TYPE REPLACED	REMARKS
Wear Plates for Cold Draw Buggies	Graph-Mo	1500° F. Quench vertically into still oil. Temper at 400° F.	60 to 62 Rc	1 Year	Cast Metal	Few Weeks	The buggies either do not have wear plates or else contain soft cast metal plates that wear rapidly.
Wear Plates for Rotoroll Main Die Head	Graph-Mo	1500° F. Quench in still oil. May be removed at 400° F. and held under a press until cold. Temper at 400° F.	60 Rc	Good	Welded	.....	Graph-Mo plates are fitted into the windows of the machine, replacing the old method of welding and remachining these locations. The Graph-Mo plates can be changed by removing a set of screws.
MAINTENANCE DEPARTMENT							
Pistons for Air Hammers	Graph-Tung	1450° F. Quench in brine at 120° F. Temper at 300 to 350° F.	63 to 65 Rc	16 Months	S.A.E. 52100 and 1 pct C Water Hardening	1 Month	Graph-Tung pistons are centerless ground and tempered at 300° F. Chromium plating not recommended. Vibration reduced with a 1¼ in. radius on the end of the chisel and by making the chisel contact end of the piston perpendicular to the center line of the piston.
Pistons for Concrete Buster Hammer	Graph-Tung	1450° F. Quench in brine at 120° F. Temper at 450° F. Retemper large end at 900° F.	62 to 64 Rc Large End 40 to 45 Rc	2 Years	Water Hardening	6 Months	.....
Pistons for Heavy Duty Air Hammers	Graph-Tung	1475° F. Quench in brine at 120° F. Temper at 450° F.	62 to 64 Rc	3 Years	1 pct C Water Hardening	15 Minutes	Piston: 2 in. in diam. by 15 in. long
Pistons for Tamping Hammers	Graph-Tung	1450° F. Quench in brine at 120° F. Temper at 450° F. Temper 6 in. of working end in salt bath at 900° F.	62 to 64 Rc Working End 40 to 45 Rc	2 Years	1 pct C Water Hardening	2 Months	.....
Pressure Thimbles for Saw Grinders	Graph-Tung	1450° F. Quench in brine at 130° F. Temper at 300° F.	64 to 65 Rc	3 Years	Oil and Water Hardening	3 Months	The thimbles are not lubricated.
Screws and Nuts for Tool Grinding Vices	Graph-Tung	1525° F. in salt bath. Oil quench. Temper at 300° F.	63 to 64 Rc	2 or 3 Years	Bronze and Soft Steel	2 Months	The vises are used to hold chisel and billeteer tools.
SHIPPING DEPARTMENT							
Dies for Shipping Tags	Graph-Mo	1500° F. Oil quench. Temper at 350° F.	61 to 63 Rc	Still in Service After 2 Years	Manganese Oil Hardening	3 Months	The dies are used to cut zinc strip. The manganese oil hardening dies were chipped along the edges and showed pick-up in a short time.

Graphitic tool steels (continued)

alternate tempers and cold treatments at 300°F and —100°F, respectively, with a final temper at 300°F.

Applications of graphitic steels, particularly in blanking, forming and gage applications, have been published but none of these have covered the wide variety of its uses in Timken's steel mill. The data compiled over a period of years on those steel mill jobs where graphitic steels have been used appears in Table VIII. Complete information on heat treatment, hardness, type steel replaced, together with comments on service performance are included. Acknowledgment is due G. A. Stumpf, Maintenance Metallurgist, for the data on steel mill applications.

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References

[1] "Galling Test of Graphitic and Regular Oil Hardening Die Steels," A. P. Sprankle and R. W. Dayton—Metal Progress, July, 1948.

[2] "A Constant-Pressure Lathe Test for Measuring the Machinability of Free Cutting Steels," F. W. Boulger, H. L. Shaw and H. E. Johnson, Trans. ASME, July, 1949.

[3] "Some Effects of Quenching and Tempering on Residual Stresses in Steel," A. L. Boegehold—Metal Progress, February, 1950.

[4] "Developments in Graphitic Steel for Tools and Dies," F. R. Bonte and Martin Fleischmann—Metal Progress, April, 1937.

[5] Graphitic Steel—"Its Fabrication, Heat Treatment and Application to Dies and Punches," G. A. Stumpf and F. R. Bonte—Steel, August 30, 1937.

[6] "Die Costs Cut With Graphitic Steels," F. R. Bonte, American Machinist, March 10, 1937.

[7] "Die Design," Ward G. Kifer—Iron Age, January 9, 1941.

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Cut maintenance costs. Apply RUST-OLEUM directly over rusted surfaces without removing all the rust! Just wirebrush and use sharp scrapers to remove rust scale and loose particles, then apply by brush, dip, or spray. Costly sandblasting and chemical precleaning are not usually required. Specify RUST-OLEUM for every rustable metal surface. Prompt delivery from Industrial Distributors in principal cities.

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2563 Oakton Street, Evanston, Illinois

FREE SURVEY: A RUST-OLEUM specialist will gladly survey your rust problems. He'll make specific tests and recommendations. No cost or obligation. See Sweets for complete catalog and nearest RUST-OLEUM distributor, or write for literature on your company letterhead.

Protects Tanks, Girders Fences, Stacks, Metal Sash, Roofs, Buildings, Marine and Railroad Facilities

Stopping Rust with RUST-OLEUM 769 D.P. Red Primer

Look for this label. Be sure it's genuine RUST-OLEUM!

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- ☐ Have a Qualified Representative Call
- ☐ Full Details on Free Survey
- ☐ Complete Literature
- ☐ Nearest RUST-OLEUM Source

years on those steel mill jobs where graphitic steels have been used appears in Table VIII.

SHENANGO *Centrifugal* CASTINGS ... KEY TO SAVINGS

Typical of innumerable special shapes cast centrifugally *by Shenango, these splined "star" rolls of Meehanite Metal are used to convey coated cloth and synthetic material through a hot fast-drying process.*

Why these rolls will do a **better** job, **longer!**

WHEN symmetrical shapes, such as these "star" rolls, are cast *centrifugally* by Shenango, they gain qualities that can't be matched in ordinary castings.

For example, metal for metal there's pressure-dense grain for finer, smoother finish; higher tensile to better resist stress and impact; freedom from sand inclusions, blow holes and other hidden defects to reduce rejects and avoid costly, unexpected failure.

So, when it comes to symmetrical shapes, large or small, ferrous or non-ferrous, you'll always be time and money ahead when you specify Shenango *centrifugal* castings . . . either rough or precision finished in the modern Shenango shops.

HELPFUL BULLETINS

Bulletin No. 150 covers Shenango non-ferrous centrifugally cast parts; Bulletin No. 151 for parts of Meehanite Metal, Ni-Resist and other special iron alloys. Either or both are yours for the asking.

SHENANGO-PENN MOLD COMPANY
2891 West Third Street • Dover, Ohio
Executive Offices: Pittsburgh, Pa.

SHENANGO

ALL RED BRONZES • MANGANESE BRONZES • ALUMINUM BRONZES
MONEL METAL • NI-RESIST • MEEHANITE® METAL

Free Publications

Continued

Electronics

"RCA Products for Industry," a new 28-p. illustrated booklet describes major industrial equipment designed to lighten work loads, enhance safety, and add to man's pleasure. Described are such items as electron microscopes and electron diffraction equipment, metal detectors, dielectric and induction heating equipment. *Radio Corp. of America.*

For free copy insert No. 15 on postcard, p. 117.

Motor brushes

Anticipating wide-spread acceptance of the Assn. of Iron & Steel Engineers Standards for mill motor brushes, a new bulletin lists National mill motor brushes according to AISE standard numbers and code numbers. Each brush is designed to give maximum performance on the motors specified. *National Carbon Co.*

For free copy insert No. 16 on postcard, p. 117.

Tester

Complete information on the industrial electronic surge comparison tester is available in a new 8-p. bulletin. The tester is used mainly to locate insulation faults and winding dissymmetries in various electrical apparatus. Diagrams and descriptions of test connections for 2-coil comparison, 3-phase, and surge induction tests are presented. *Westinghouse Electric Corp.*

For free copy insert No. 17 on postcard, p. 117.

Springs

The place of alloys v. straight carbon steels in mechanical springs is the subject of a story in the latest issue of *The Mainspring.* The article answers many questions on the proper materials for such applications as valve springs, and what gives steels the properties necessary for long spring life. *Associated Spring Corp.*

For free copy insert No. 18 on postcard, p. 117.

Power

Design and application features of Life-Line motors in ratings up to 700 hp are described in a new 20-p. booklet. Special construction features are described. *Westinghouse Electric Co.*

For free copy insert No. 19 on postcard, p. 117.

ALUMINUM FROM CANADA

to alleviate the shortage

At the rate of millions of pounds per year, aluminum ingot for defense comes to the U. S. from one of the world's great producers — Aluminum Company of Canada, Limited ("Alcan").

Alcan aluminum, an economical supplement to U. S. production, helps to keep more than a million persons busy in foundries and fabricating plants — plants that are turning out thousands of lightweight, long-lasting products for defense, industry, farm, and home.

But still more aluminum is needed. That's why Alcan — whose products we distribute — is building a new plant at Kitimat, British Columbia. In its initial phase, this plant will make available 200 million pounds more aluminum per year.

ALUMINUM IMPORT CORPORATION

Distributing company, in the Western Hemisphere, of the **ALUMINIUM LIMITED** *group*

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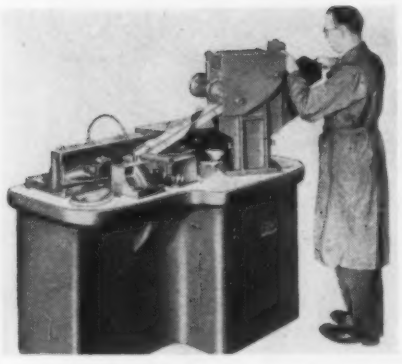
Cable address: ALIMPORT

NEW equipment

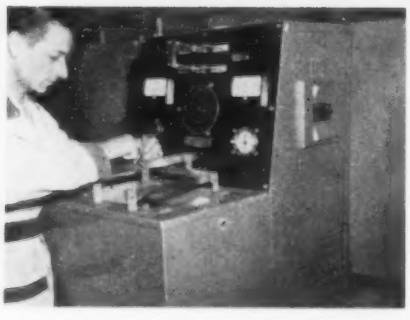
New and improved production ideas, equipment, services and methods described here offer production economies . . . fill in and mail postcard on page 117 or 118.



Thread roller rated at 80 to 140 screws per min

Larger capacity automatic thread roller will roll machine screws from size 6 to 5/16 in. diam and thread lengths up to 2½ in. Production rates are 80, 100, 120 and 140 pieces per min dependent upon size of screw to be rolled. The machine is 62 in. long x 39½ in. high with overall height 63½ in. Standard die dimensions are 15/16 in. thick x 5 in. long for the moving die and 15/16 in. x 4¼ in. for the fixed die. Standard die depths are 1, 1½, and 2⅛ in. with a special depth of 2⅝ in. After rolling, screws are automatically ejected into a funnel which leads to a tote box. The thread roller is equipped with a 5 hp motor with automatic cut-out for overload safety. *Hartford Special Machinery Co.*

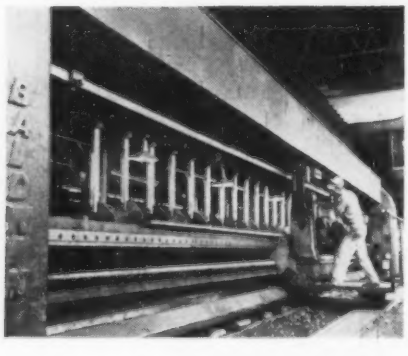
For more data insert No. 20 on postcard, p. 117



On-the-spot chrome plating effects savings

Large and small shops can effect savings by doing their own plating, using a new bench model hard chrome plating unit. Plater has all controls, transformers, rectifiers, switches and heating elements, including the plating tank, contained within the unit. A current source and duct outlet are the only connections required for immediate operation. Cutting tools, gages, dies, molds and machine wear parts are said to average 300 pct longer life when chrome plated, and mismachined or under-size ground tools can be salvaged by chrome plating back to size. *Cro-Plate Co.*

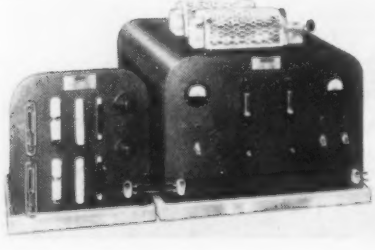
For more data insert No. 21 on postcard, p. 117



High speed metal planer uses dynamic braking

Used primarily to bevel steel plate prior to welding, the 40-ft, open throat planer installed by Wyatt Metal & Boiler Works, has a top carriage speed of 45 fpm. With a ⅛-in. feed and a carriage travel of 15 fpm, it can remove 34 cu in. of material a minute from mild steel plate 1½ in. thick. Although designed to handle material 40 ft long, the control clamping jacks have been sectionalized for the widest possible range of plate lengths. The 27 jacking cylinders, operated by 90-psi compressed air are capable of exerting a total of 270,000 lb clamping pressure. They can be worked in groups or all together. *Baldwin-Lima-Hamilton Corp.*

For more data insert No. 22 on postcard, p. 117



Unit package determines carbons-by-combustion

Carbotrane, a complete, self-contained piece of laboratory apparatus, is a compact arrangement of throwaway and quickly replaceable glass cartridges containing reagents used in the determination of carbon in metals. It is a fitting companion to the modern furnace and balance. Two models are available: A single train for average laboratory use; double train for high production or for standby convenience. *Burrell Corp.*

For more data insert No. 23 on postcard, p. 117

Turn Page

FLAT SPRING STEEL

You can get it now! . . . and we believe it's the best spring steel we've ever made

OUR NEW specialty spring steel plant is in full swing. Equipped with today's most modern, precision machines, we believe we're producing flat spring steel that gives more for your money than ever before.

This new spring steel is tops in uniformity. It saves you preparation time . . . cuts down machine stoppages . . . gives you the greatest number of perfect parts from every foot and pound of steel.

With our greatly increased capacity we can make prompt deliveries on flat spring steel. And if you need high carbon round or shaped wire, ask what we can do. John A. Roebling's Sons Company, Trenton 2, N. J.

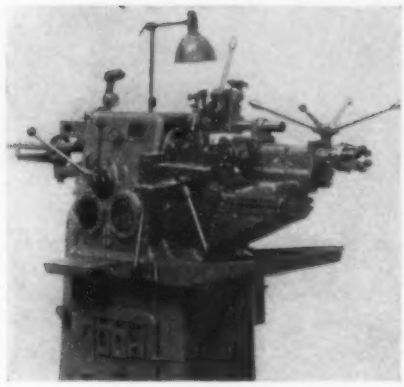
ROEBLING

ATLANTA, 934 AVON AVE • BOSTON, 51 SLEEPER ST • CHICAGO, 5525 W. ROOSEVELT RD • CINCINNATI, 3253 FREDONIA AVE • CLEVELAND, 701 ST. CLAIR AVE, N. E. • DENVER, 4801 JACKSON ST • DETROIT, 915 FISHER BLDG • HOUSTON, 6216 NAVIGATION BLVD • LOS ANGELES, 5340 E. HARBOR ST • NEW YORK, 19 RECTOR ST • ODESSA, TEXAS, 1920 E. 2ND ST • PHILADELPHIA, 230 VINE ST • SAN FRANCISCO, 1740 17TH ST • SEATTLE, 900 1ST AVE S. • TULSA, 321 N. CHEYENNE ST • EXPORT SALES OFFICE, TRENTON 2, N. J.

Core grinder produces uniformly flat faces

For use in production or jobbing foundries, a portable core grinder handles a large range of core sizes and produces uniformly flat faces without broken edges. It is sturdily constructed for continuous and intermittent use and is mounted on large size casters for quick spotting wherever needed. The core grinder employs an 18-in. diam grinding wheel mounted on an adjustable head that locks firmly in any position. Maximum clearance between the table and face of grinding wheel is 18 in.; maximum working capacity is 15x24-in. core surface. Small cores can be mounted in multiples in gang fixtures. The machine can handle cores of one size in production quantity, or it can be adapted quickly for short runs on cores of various sizes. The grinder is supplied complete with 1 hp 220/440 v fully enclosed motor which drives grinding wheel at 660 rpm. *Milwaukee Foundry Equipment Div., Spo, Inc.*

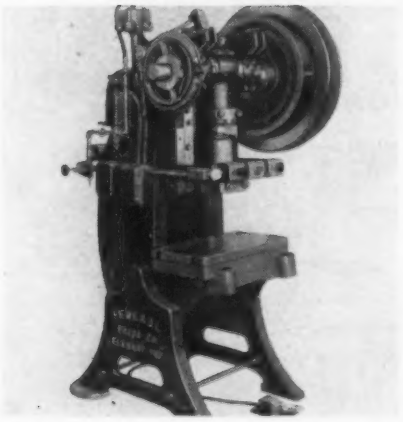
For more data insert No. 24 on postcard, p. 117.



Lathe built for ultra-precision machining

Combining extreme precision in machining operations with an unusual degree of simplicity in setting up, the Hestika Model HR 26 turret lathe is adapted to economical production of single pieces or short runs within very close tolerances. A short throw turret hand feed permits short machining cycles in the production of formed parts from bar stock, turning of cast or pressed components, as well as finishing and second operations on pre-machined work. The turret can be used with 3, 4, 5 or 6 tools. One or more drilling spindles may be set up on the turret tail stock for small, accurate holes. Bed length is 23½ in. and maximum collet capacity 1 in. *Kurt Orban Co., Inc.*

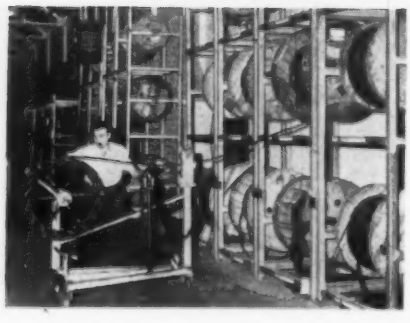
For more data insert No. 25 on postcard, p. 117.



Punch press has new clutch-brake mechanism

The Federal line of punch presses has been redesigned to include a new clutch - brake mechanism, known as the Smooth-Air and controlled electro - pneumatically controls. In the mechanics of the new clutch, compressed air expands a rugged rubber - and - fabric tube, thereby engaging the clutch to any degree of grip required. This actuating tube is molded to the structure of the flywheel. Full operating torque results from 360° of pressure applied near the maximum diameter of the flywheel. Overload protection is provided. The spring-tension brake is also released by compressed air. A single solenoid synchronizes the air actuation of the brake and clutch. Electro-pneumatic controls permit single tripping as well as continuous operation. *Federal Press Co.*

For more data insert No. 26 on postcard, p. 117.



Reel rack conserves storage space

Storage space is conserved and handling of reels of cable, wire, tubing, rope, is made more efficient by a new stacking rack. The reel is placed in the rack at floor level; U's provided on the cross members locate the reel axle. Reel and rack are then handled as a unit by lift truck. The racks are of welded square tube construction with self-aligning nesting feet that make stacking sure and easy. With each reel free to rotate independently, lengths of material can be dispensed readily as needed. Racks are of welded square tube construction. *Equipment Mfg., Inc.*

For more data insert No. 27 on postcard, p. 117.

Die lift tables

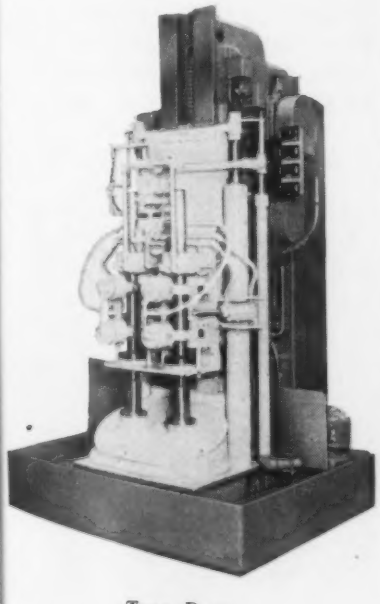
Die lift tables designed to meet a wide range of industrial applications are of rugged construction, built in table sizes from 30x36 in. to 44x84 in. with 4 to 10 tons capacities. Standard elevations are 30 to 46 in., mechanically operated. Air-operated or hydraulically-operated units are also available. Special features include efficient operating mechanism, four - point support, magnetic reversing starter, transformer for 110 v operation, push-button control, positive truck locks. *Union Tool Corp.*

For more data insert No. 28 on postcard, p. 117.

Shell boring

Increased production is attained in boring and counterboring operations on 4.2 in. chemical mortar shells with the Baker 30 HO boring machine illustrated. Capable of turning out 56 parts per hr at 100 pct efficiency, the machine is high speed, heavy duty, two spindle inverted type, utilizing hydraulic feed. It uses No. 6 Morse taper drills with provision for use of pick-off speed change gears. Oilgear hydraulic feed pump is arranged for individual motor drive. *Baker Bros., Inc.*

For more data insert No. 29 on postcard, p. 117.



Turn Page

IRIDITE

WANT CORROSION RESISTANCE? Iridite will give you better-than-specification protection against corrosion.

WANT PAINT ADHERENCE? Iridite provides a firm and lasting base for paint by preventing under-film corrosion.

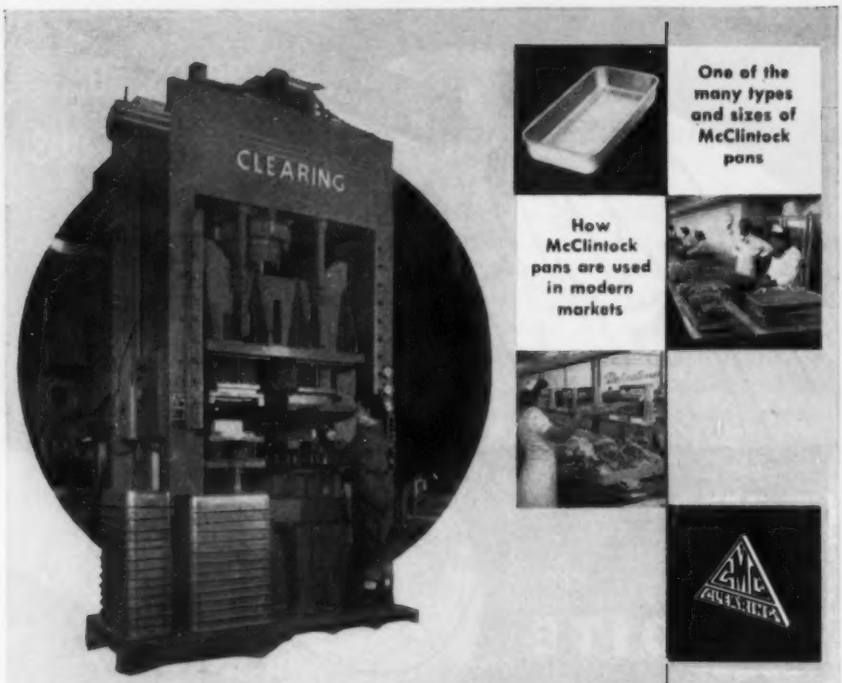
WANT EYE-APPEAL? Iridite can give you a variety of finishes, depending upon the metal being finished . . . from clear and sparkling bright or military olive drab, to attractive dyed colors.

BEST OF ALL, any Iridite finish is economical and easy to apply.

IRIDITE

Simple chemical dip; immersion time only 10 seconds to 2 minutes; no sealing dip; color is clear or yellow depending upon your requirements; salt spray resistance equivalent to 20 to 30 minutes of anodizing, eliminates need for costly racks and electrical power.

ALLIED RESEARCH PRODUCTS
INCORPORATED
4004-06 E. MONUMENT STREET • BALTIMORE 5, MD.



SMOOTH way to do a SMOOTH JOB

McClintock Manufacturing Co. of Los Angeles manufactures an extensive line of metal platters and pans used by up-to-date markets for the display of meat. For space in the cabinets, the pans must be rectangular; for sanitary reasons they must be one-piece and perfectly smooth. And they can't cost too much, either.

In the picture you see how McClintock uses a Clearing hydraulic press in drawing these pans. Automatic sequence control simplifies operation and delivers maximum production. Cushion pressure is accurately regulated, and the result is a smooth piece smoothly produced every time.

Whether your metal forming problem is like this one, or entirely different, Clearing engineers can help you. Clearing makes both mechanical and hydraulic presses to fit virtually any production requirement.

CLEARING MACHINE CORPORATION
6499 WEST 65TH STREET ★ CHICAGO 38, ILLINOIS
HAMILTON DIVISION, HAMILTON, OHIO

CLEARING PRESSES
THE WAY TO EFFICIENT MASS PRODUCTION

—New Equipment—

Continued

High-strength nut

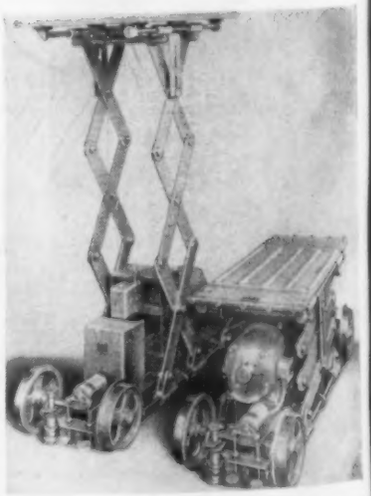
An external wrenching nut can be applied where high strength is required and clearances are small. Tensiles are said to be consistently in excess of 160,000 psi. Because it does not have to seat to lock, the Flexloc is a stopnut as well as a locknut, locking securely in any position on a threaded member. Its all-metal, one piece construction permits its use at 500°F temperatures without loss of locking efficiency. Under latest government specifications for aircraft, the nut is approved in sizes from ¼ to 1½ in. in the NF thread series. *Standard Pressed Steel Co.*

For more data insert No. 30 on postcard, p. 117

In-work handling

Two special Portelvators are designed to meet special requirements of rapid delivery of orders that require one or several operations performed after the order is received. Material in quantity is processed through the primary operation and sent to storage to await subsequent operations. The material handling units operate on track which skirts the storage shelves and processing stations, are moved manually from station to station, and are elevated electrically. Scissor type lift mechanism is operated by 1 hp motor; motor is actuated through foot control from either end of table. Table size is 24x36 in. *Hamilton Tool Co.*

For more data insert No. 31 on postcard, p. 117



Milling cutter

An improved milling cutter has been designed primarily for steel production milling runs where adequate horsepower is available, and where intermittent or narrow cuts are encountered. It is also well-suited for heavy cast iron cutting. The KF Kennamill has only four different parts: body, blades, wedges, and nuts. Stud-type wedges and screws are one-piece high-alloy steel, hardened and ground to close tolerances. They remain assembled to the cutter body at all times. Interchangeable blades are heavy, solid, wedged-in, tightened by a hex wrench. Cutters are made in 6, 8, 10 and 12 in. diam., right or left hand. *Kennametal Inc.*

For more data insert No. 32 on postcard, p. 117

Paint sprayer

A new heavy-duty Paintmaster features an extra powerful, air-operated pump for handling in volume the new-type coatings, extremely heavy paints and many other fluids. The Paintmaster works right from the original container, doesn't pressurize the drum. This minimizes aeration and eliminates bubbles and pinholes in the finished surface. Pumps are designed for supplying long-line circulating systems and multiple spray guns. *Gray Co., Inc.*

For more data insert No. 33 on postcard, p. 117

Non-flooding pen

New industrial instrument pens eliminate flooding and reduce paper plugging and choking. Pens have removable tips and a new reservoir construction that eliminates flooding because effective ink level is always below the writing tip. *Minneapolis - Honeywell Regulator Co.*

For more data insert No. 34 on postcard, p. 117

Turn Page

MORE than a "Coolant" is needed

"COOLANT" is a misnomer as applied to *cutting fluids*. You won't get far with just a coolant. The fluid used for metal cutting must have multiple characteristics in order to provide the desired finish and tool life at the required production rate:

- **Cooling Action** — very necessary to carry away the heat generated by machining, but only part of the function.
- **Lubricity** — to reduce friction between the tool point and the work piece. The lubricating qualities of the cutting fluid make a big difference.
- **Anti-Weld Properties** — to prevent build-up of metal on the tool and scuffing of the work piece. The amount of anti-weld agent in the fluid is a critical factor and depends on the job.

These factors and others are all inter-related. Over-simplification of the subject and the cutting fluid can lead to trouble. Let a Stuart sales-engineer show you what can be accomplished with the *right* cutting fluid.

Ask for Bulletin

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D.A. Stuart Oil Co.

2737 S. Troy Street, Chicago 23, Ill.

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Cutting Fluids and Lubricants

Specialists in Industrial Cleaning Products

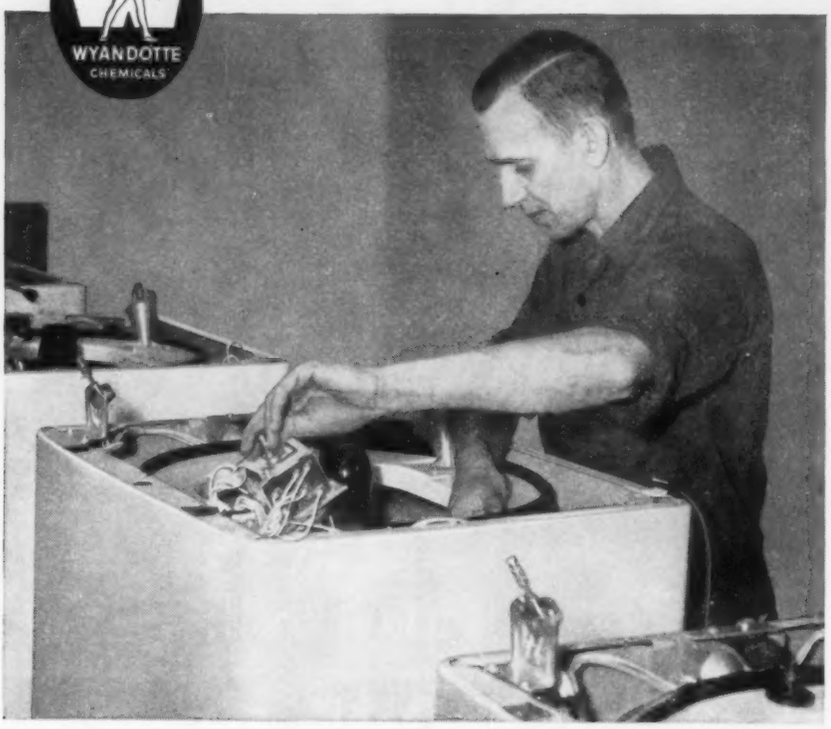

Photo Courtesy Whirlpool Corp.

How Wyandotte Service helped the Whirlpool Corporation!

THE SPARKLING white Whirlpool automatic washers you see coming off the production line are really wonder workers. They're going to save time, trouble and money for a lot of people.

Behind their manufacture is a great success story. It began with an idea. It grew through ingenuity and the finest methods and machinery obtainable to mass-produce quality products. Wyandotte (the world's largest manufacturers of specialized cleaning products for business and industry) has worked hand-in-hand with Whirlpool over the years.

Mr. Morgenstern of the Whirlpool Corporation reports: **"When we switched over to modern, high-speed equipment for finishing Whirlpool parts, a Wyandotte representative worked with us night and day. He recommended the right metal cleaner for each job . . . We are currently using Wyandotte BN, EMLON*, METAL CLEANER 38 and R2 in our various processes. We figure his efforts saved us time, upped quality, and cut cleaning costs."**

Have you a metal cleaning problem? Contact us! *Wyandotte Chemicals Corporation, Wyandotte, Michigan; also Los Angeles 54, Calif.*

*REG. U.S. PAT. OFF.

Largest manufacturers of specialized cleaning products for business and industry

Wyandotte CHEMICALS

Helpful service representatives in 88 cities in the U.S. and Canada

—New Equipment—

Continued

Heavy duty punches

An extra heavy duty series of punches for piercing ⅜ in. or heavier plate feature interchangeability, quick insertion and removal, and longer life. A ¾ in. ball lock in the punch retainer provides increased stripping capacity. The lock gives the punch positive radial alignment without the use of other keying devices. *Richard Bros. Div., Allied Products Corp.*

For more data insert No. 35 on postcard, p. 117.

Dust respirator

Ten recently engineered advances are incorporated in a dust respirator, called the Dustfoe No. 55. It weighs only 2¾ oz. Breathing resistance has been cut in half, with users of pilot models reporting they were "hardly conscious of wearing a respirator." Reduction in width of filter holder eliminates a blind-spot and increases downward vision. Simplicity reduces maintenance requirements. Quick changing of filters and easy replacement of parts are possible. Formable aluminum facepiece is readily molded to all normal face contours. *Mine Safety Appliance Co.*

For more data insert No. 36 on postcard, p. 117.

Metal inspection

Nineteen Cobalt - 60 radiography sources ranging in strength from 50 millicuries to 25 curies are available for use by foundries, heavy metal fabricators and welding shops. Cobalt-60 is said to offer an excellent means for the non-destructive inspection of metal objects for flaws. Its gamma rays have energies said to permit examination of steel from ½ to 6 in. without excessive exposure times. Sources are only 21 mm. long x 10 mm. wide, allowing them to be placed inside complex castings; are made of ferromagnetic stainless steel; have a large threaded hole to accept a remote handling rod; a small hole to allow handling with string; and have flats machined on each side to prevent rolling. *Tracerlab, Inc.*

For more data insert No. 37 on postcard, p. 117.

Gouging electrode

A specially formulated electrode designed for gouging, chamfering, cleaning and partial milling operations on any metal or alloy is claimed to speed up fabricating of armor plate and similar difficult-to-cut alloys. ChamferTrode features a heavy coating which forms a cone at the striking end of the electrode, providing a natural jet effect arc. This intense, concentrated source of heat removes unwanted metal so swiftly that the metal itself remains relatively cool. Surface of the gouged or chamfered material is said to be free from oxidation and slag, providing clean surface for later brazing or welding operations. *Euctectic Welding Alloys Corp.*

For more data insert No. 38 on postcard, p. 117.

Masking tape

Stain-resistant masking tape is designed for use on lacquered, enameled, painted and porcelained surfaces where color separation, masking, packaging and holding functions are required. It is particularly effective on white, off-white and light pastel colored surfaces. The facilities of the company's research laboratories are available for discoloration and accelerated aging tests. Invitation is extended to forward sample panels or samples of the finishing agent that is to be exposed to pressure sensitive tape application. *Behr-Manning Corp.*

For more data insert No. 39 on postcard, p. 117.

Rust proofing

Versatile chemical treatment removes rust, tarnish and light oil, chemically prepares metals for paint, and retards corrosion. Known as Rustclean, the compound destroys rust and rust-promoting surface contaminants. It not only chemically cleans the surface of steel, iron, aluminum, zinc and cadmium, it also forms a phosphate coating that acts as a base for organic finishes. It is an effective tarnish remover for copper and its alloys. Several types are available, each designed for different work. *Octagon Process, Inc.*

For more data insert No. 40 on postcard, p. 117.

Turn Page

Top Brass!

Teamwork builds better torches for you at Weldit. New ideas, designs and applications for Weldit torches are constantly being reviewed by this top team of Weldit executives and engineers. The team's experience, ability and training is reflected by the popularity of Weldit torches throughout industry.

Weldit torch performance assures you of the finest quality of welding . . . increased production . . . and reduced costs.

The Weldit team has many *firsts* to its credit. Notably, the famous *Weldimatic* torch and the ever popular Weldit Gasaver.

Weldimatic natural action!
To light—squeeze, to shut off—release grip. Illustrated, Weldit Model W-46 *Weldimatic* Welding Torch.

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The Iron Age 100 E. 42ND STREET NEW YORK 17, N. Y.

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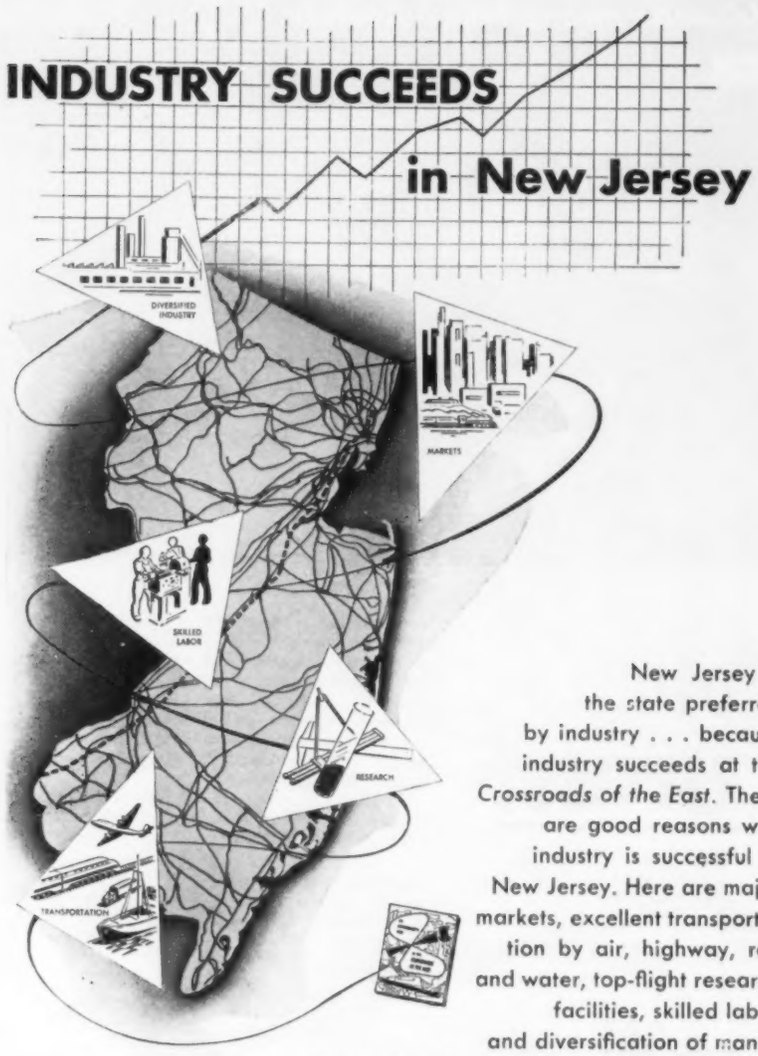

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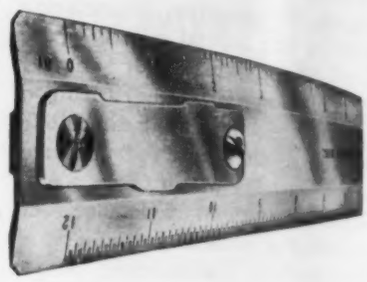
—New Equipment—

Continued



Drafting scales

Standard metal drafting machine scales, trade-named Duraline, consist of 12 standard types of graduations most used by civil, mechanical and electrical engineers, draftsmen and architects. Each style is available in 6, 12, 18 and 24-in. lengths. Duraline scales are made of an aluminum alloy. They maintain their engine divided accuracy and hold a true smooth ruling edge. Duraline makes the scale quick-reading, eliminates glare under any lighting, and prevents the metal from smudging the drawing paper. *Universal Drafting Machine Corp.*

For more data insert No. 41 on postcard, p. 117

Portable extinguisher

With trigger-type finger control, a new pressure-operated portable fire extinguisher weighing 5 lb can be recharged in the field. Five pounds of dry chemical are poured into the powder chamber and charged with 150 lb of compressed air. The nozzle discharges a cloud-like pattern which is most effective for extinguishing flammable liquid and electrical fires. Range is 5 to 7 ft. *Walter Kidde & Co., Inc.*

For more data insert No. 42 on postcard, p. 117

Quick-setting patch

Permamix, a new floor patching material, can be used on any present type flooring. It is ready for instant use, indoors or out, just as it comes from the container. It will not freeze, can be stored indefinitely and used in any temperature. Permamix sets instantly, traffic can be resumed immediately. *Permamix Corp.*

For more data insert No. 43 on postcard, p. 117

—Technical Briefs—

Tests Belts:

Laboratory machine tests the life of conveyer belts under load.

A conveyer belt testing machine, one of the world's largest, is taking the guess work out of conveyer belts at Raybestos-Manhattan's laboratory at Passaic, N. J.

First of its kind, the machine will benefit industries that move bulk material in volume, particularly coal and ore mining, quarries, large plants and coal-fuel utilities.

Production-scale belts up to 30 in. wide and 80 ft long can be handled at loads up to 200,000 lb total tension.

Duplicating actual conveyer equipment arrangement of head, snub, bend, takeup, and tail pulleys, with adjustable angle and elevation of troughing idler pulleys, automatic recorders trace simultaneously, power input, stretch, tension and speed at any speed up to 2,000 fpm.

Effects of pulley size, actual strength and factors of safety of a conveyer belt running over pulleys with any predetermined amount of tension load and overload may be observed.

CONVEYER belts get rough treatment on world's largest laboratory testing machine set up at Raybestos-Manhattan's laboratory at Passaic, N. J.

Insulating Varnish Developed

An all-purpose electric insulating varnish developed by General Electric's Chemical Div. has been suggested for use on a variety of electric equipment.

It is suitable for treating motor and generator cores and windings, magnet coils, and transformer windings. The oil modified phenolic varnish may be used on rotors with speeds up to 10,000 rpm.

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Gives You Better Tapping at Lower Cost

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Correctly designed to provide freer chip flow and longer tap life.

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Square and shank fit correctly in chucks and holders, no wobble to cause oversize holes.

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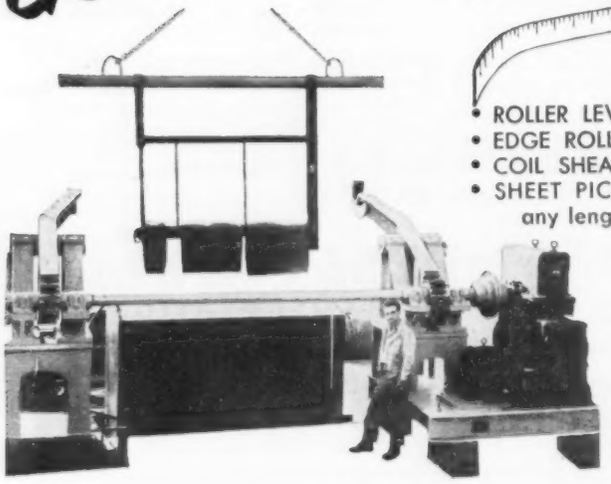

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—Technical Briefs—

Foundry Sand:

Magnetic unit removes core wire, tramp iron from sand at low cost.

Core wire and tramp iron are being inexpensively removed from foundry sand with a permanent magnetic drum installation at the Meadow Lands, Pa., plant of American Brake Shoe Co.

The unit, produced by Eriez Mfg. Co., is part of a sand reconditioning system. The magnet installation consists of an 18-in. wide revolving cylindrical shell within which a stationary high-powered Alnico permanent magnet is located. The magnet covers about half of the cross-sectional area of the drum.

Ferrous-contaminated sand is directed into the drum hopper. The sand then falls onto the revolving stainless steel shell. The magnetic tramp iron adheres while the non-magnetic sand falls off and out through a discharge chute. The iron sticks to the shell until rotated out of the magnetic field. It is then released and discharged into a separate chute.

Tramp iron separation is a completely self-powered operation requiring no power and involving no operating costs. The units are recommended for the removal of tramp iron and medium fine ferrous contamination where materials are conveyed in spouts, chutes or similar conveying systems not employing belts.

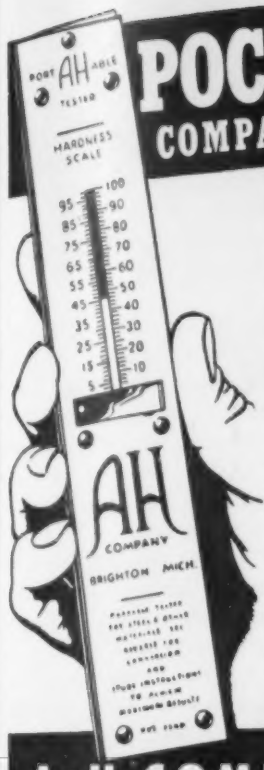
Freezing Points:

Better castings, ingots may come from Navy solidification studies.

Better iron castings and better steel ingots may result from application of new data on the freezing of liquid molten metal inside foundry molds. The studies, made by Navy research scientists, were reported recently by the U. S. Dept. of Commerce.

By suitably locating a batch of temperature-measuring thermocouples inside the mold, the Navy researchers found that the freezing proceeds inward from the

Turn to Page 134



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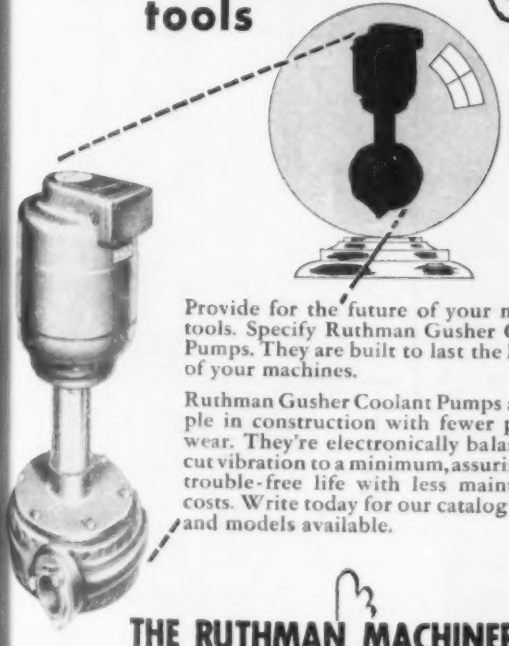
A look at the FUTURE of your machine tools



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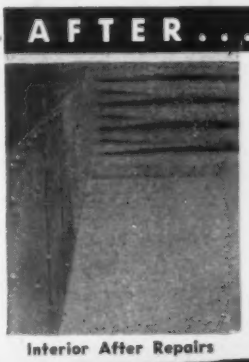
The "Before" and "After" explained below is typical of the work we can do for you—on any type of freight car!

BEFORE... this car came to CFC's Chicago Shop it had wood side planks splintered away, sheet metal patches over the biggest holes, wood flooring that was punched through, trucks needing general overhaul—in other words, it was broken-down, and costly to load, unload and haul.

Interior Before Repairs

AFTER... this car spent 10 days in the CFC Shop it was transformed into efficient rolling stock. Steel plate flooring and siding made it easy to empty and sturdy to take the abuse of unloading buckets. Welded joints added strength and completely eliminated leakage. The reconditioned trucks and repacked journal boxes provided smooth rolling. Exterior painting made it look brand new (which it practically is!).



Interior After Repairs

In addition to a complete car repair service, CFC rebuilds your cars to your exact requirements, whether for intraplant industrial use, or complete rebuilding to meet AAR specifications for mainline interchange service. CFC also designs and constructs special type new cars, and has an inventory of reconditioned cars for sale. Write for complete information.

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FEMA

—Technical Briefs—

mold walls in waves, and that the way the "freezing" waves move inward depends on the thickness and material of the mold walls. This exploration of the solidification of metal is described in a Naval Research Laboratory Report entitled *"Solidification of Steel From Sand and Chill Walls."*

Knowing that the freezing moves in wave fashion inward from the walls of the mold, the Navy scientists investigated the effects of the various factors involved in mold construction and arrived at the proper design considerations for a mold so that the "freezing" moves inward through molten iron in the proper manner to produce the best iron castings. This study is presented in another Naval Research Laboratory Report entitled *"Solidification of Gray Iron in Sand Molds."*

Again, using this knowledge of the wave-like progress of solidification inside a mold, the scientists at the Naval Research Laboratory studied the solidification of molten steel in ingot molds, and found out the best conditions for casting certain shapes of steel ingots. This study they described in a third report entitled *"The Contribution of Riser and End Effects to the Soundness of Cast Steel Bars."*

"I'm afraid we're going to be investigated by Congress—I once held a job as a postal worker during the Christmas rush in my college days—oh, why did we ever borrow from the R.F.C.?"

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Weirton Steel Company, pledged to participate in defense measures in any way and to any required degree, is supplying steel on approved allocation to speed the stockpiling of America's mightiest missiles.

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See Page 3

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answers many questions that will lead you to better stripping procedures. You'll want to read more about:

What's the best way to strip large areas of structural metal where a steam supply is available? *See page 5.*

What is the best method when steam is not available? *See page 7.*

What is the cheapest way to strip metal parts in large volume? *See page 9.*

What are the best ways to prepare stripped surfaces for repainting? *See page 11.*

What strippers are best for removing oil-base paints? . . . Synthetic enamels, alkali-resistant plastics or resin-based paints? . . . Japans, wrinkle finishes, nitrocellulose lacquers, alkyds, phenolics and ureas? *See page 12.*

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—Technical Briefs—

Welding:

Galvanized angle iron reported welded without coating loss.

Galvanized angle iron can be welded without losing the galvanized coating, it is reported. The method has been accepted as "satisfactory" for frames supporting air conditioning coils in the new Prudential Insurance building in Houston.

The method, utilizing a Heliarc torch with Everdur filler rod, did not decrease appreciably the resistance to corrosion, even though there was some loss in the thickness of the zinc coating. The slight loss noted next to the weld was due to direct vaporization under the heat of the arc.

Least disturbance of galvanized coating and most efficient tinning of the base metal was obtained when the arc cone was directed as much as possible on the weld deposit. Welding was done from both sides of the angle. A 1/16-in. gap left between the legs of the angle allowed filler rod to tin more than halfway through the thickness.

Efficiency of the joint was tested by attempting to shear an angle clip from the frame using a 4-lb hammer. No failure occurred in the weld even though the legs of the angle were beaten flat.

PORTABLE apparatus has simplified welding on galvanized iron frames.

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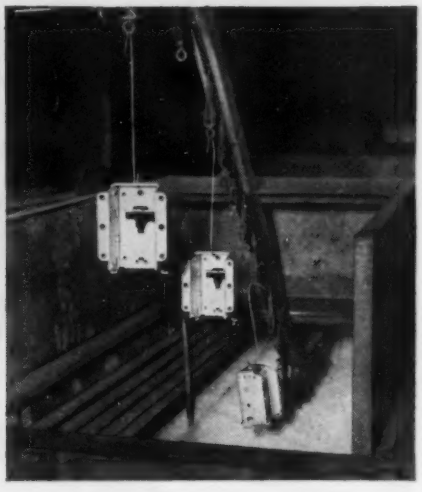
Circuit breaker unit is thoroughly cleaned in less than a minute by vapor degreasing. Equipment is simple and timesaving . . . handles metal parts of all sizes.



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Switch housings emerge clean, warm and dry from vapor degreasing unit. Conveyor system maintains smooth, even flow of housings at high production speed.

Intricate electrical equipment parts, made of all types of metal, are thoroughly cleaned by vapor degreasing with Du Pont "Triclene" D Trichlorethylene. Parts come out clean, warm and dry, instantly ready for inspection, finishing or further fabrication. The heaviest oils and grease are completely removed—usually in less than a minute!

Compact vapor degreasing units require a minimum of floor space and can be adapted to conveyorized or manual operation. Cleaning costs remain low, since contaminated solvent is readily recovered for economical re-use. That's why vapor degreasing is first choice among manufacturers for low-cost, efficient metal cleaning over a wide range of production capacities.

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—Technical Briefs—

Expanded Metal:

Refractory in cat cracker lasts longer on stretched steel lining.

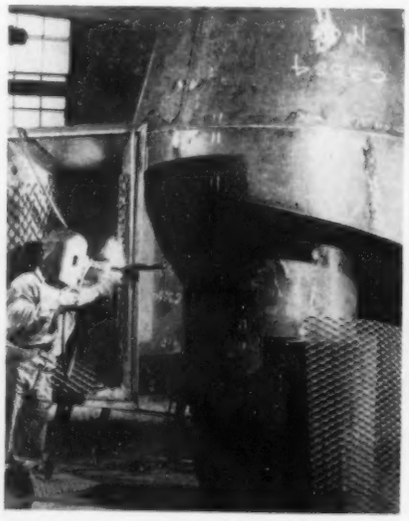
A new stretched steel lining designed to cut cat cracking costs by reducing deterioration of cast refractory is being introduced at the Baton Rouge, Louisiana refinery of Esso Standard Oil Co.

When cast refractory is put into 10 new cyclone catalyst separators there, it will be applied over Wheeling Corrugating Co.'s expanded metal to hold it permanently in place.

Expanded metal—solid sheet steel that has been slit and stretched on huge presses—forms the base on which abrasion-resistant refractory is cast after the cyclone vessels have been erected at the refinery site.

The cyclone units are about 21 ft high and have a maximum diameter of more than 6 ft. In the catalytic cracking process, they separate solid catalyst particles from the hot flue gases leaving the cat cracker regenerator.

As the cast refractory inside the cyclones must withstand continual abrasion at elevated temperatures it must be securely bonded to the inner surface. Special wide-strand expanded metal was made for the job. The metal is supplied in sheets, then formed and welded.



EXPANDED metal is tack welded inside rectangular inlet of cyclone catalyst separator to be installed at Baton Rouge refinery. Metal forms refractory base.

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If you have missed the special Iron Age series of five articles on boron steel which appeared last July and August you may want to order a reprint.

A 30-page reprint booklet covers the following:

1. *Recommended alternates for standard grades.*
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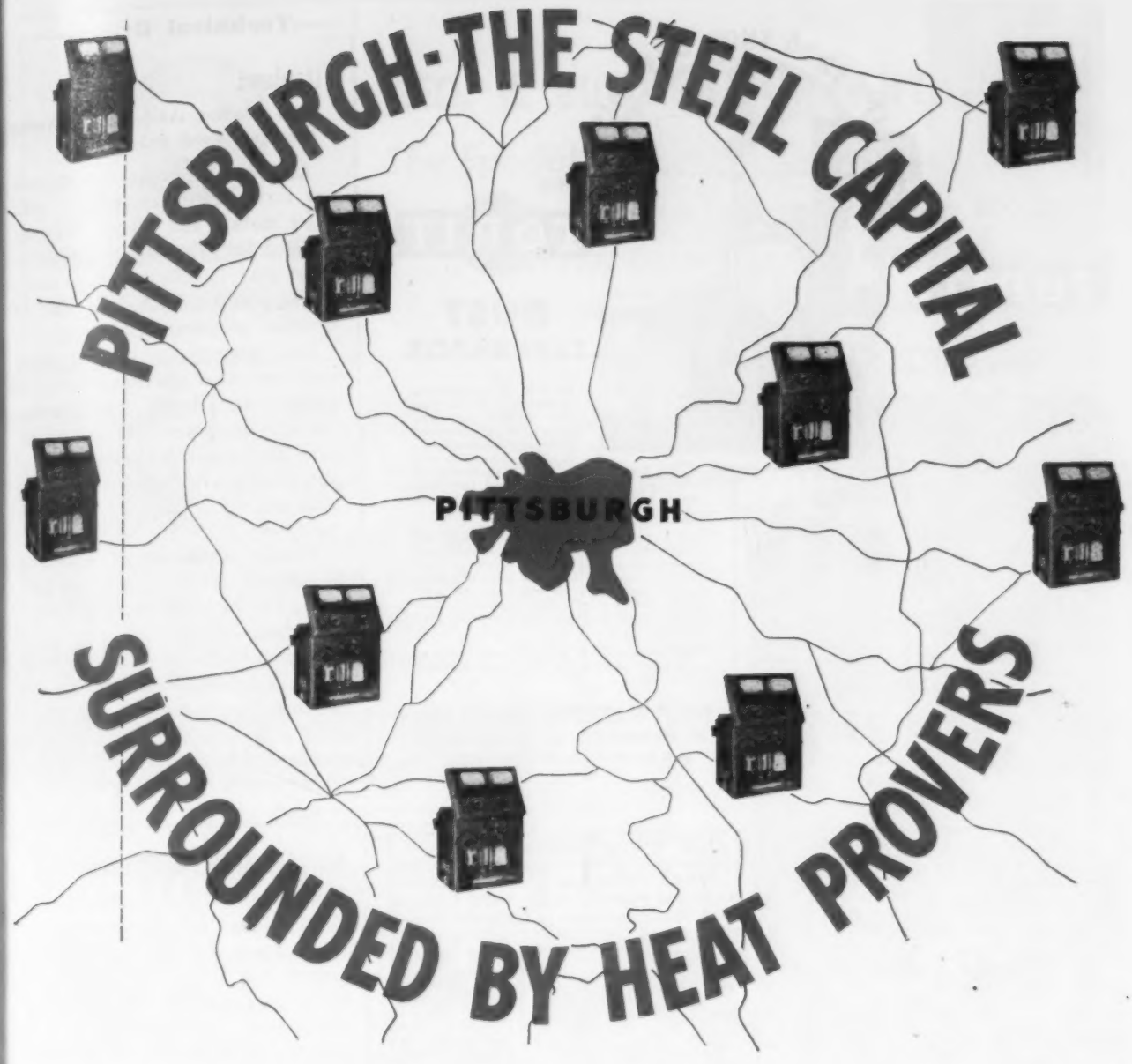

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It takes the Heat Prover to read simultaneously for oxygen and combustibles, measured direct by actual gas analysis. And the Heat Prover's continuous rapid sampling reveals effects of furnace adjustments at once. The Heat Prover frees you of maintenance too, because it's *not an instrument you buy, but a Service we supply*. Learn how it can raise productivity for you . . . in iron, steel, ceramics, glass, cement or any other furnace operation. Write CITIES SERVICE OIL COMPANY, Dept. C16, Sixty Wall Tower, New York City 5.

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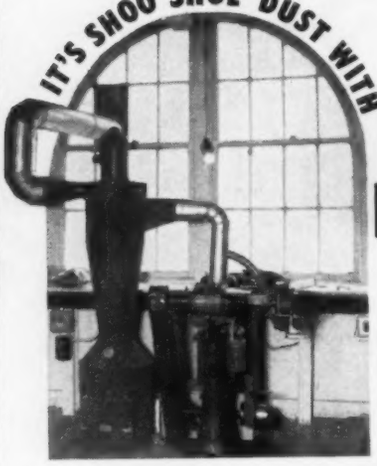

Here is an installation involving a heavy volume of dust and lint, some of it of a particularly adhesive character. It was solved to the complete satisfaction of the user and the Wisconsin Industrial Commission, with the Torit 19-FM Dust Separator illustrated.

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—Technical Briefs—

Titanium:

Fast heating, short time at brazing heat cuts metal embrittlement.

Although titanium and zirconium form brittle compounds with most metals and alloys that may be used for brazing, the embrittlement may be minimized by rapid heating and limiting the time at brazing temperature.

Low temperature brazing alloys such as Easy-Flo have been developed by Handy and Harman for this purpose. The lower temperature also minimizes oxygen and nitrogen contamination of the titanium.

Tensile strengths of 45,000 to 50,000 psi are obtained with butt joints in commercially pure titanium.

Lap joint test specimens may break outside the joint if the lap is more than three times the thickness. Heating may be done with either oxyacetylene torch or furnace; ordinary brazing technique is used.

Nitrides Affect Brittleness

Nitrogen in steels, when present as aluminum nitride, improves the low-temperature notch-toughness—lowers the temperature at which brittleness appears—in some carbon steels. A study conducted by the National Bureau of Standards indicates that nitrogen when present in the form of nitrides of iron or manganese appears to be harmful to steels from the same standpoint.

"How can I do it? Low overhead, friend, low overhead."

BULLARD

GEO. H. BULLARD COMPANY, INC.

The Specialty Manufacturing Company in the Industry

WESTBORO, MASSACHUSETTS

HIGH SPEED GRINDING WHEELS
CUT-OFF AND COPING WHEELS

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WEBB WIRE

STRENGTH UNIFORMITY DURABILITY

NEEDLE and STAINLESS

THE CARPENTER STEEL CO.
Webb Wire Div.
NEW BRUNSWICK, N. J.

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Since 1905 Hubbard has been making PARTS LIKE THESE

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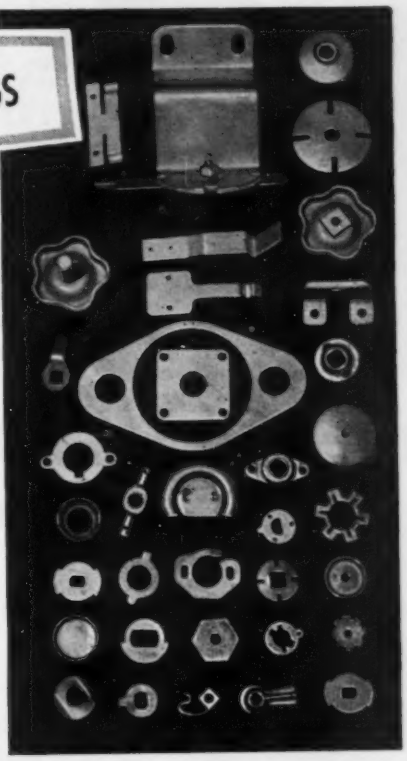

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Use this Electric Motor Clam Shell for rehandling bulk materials in Industrial Plants.

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famous for accuracy and straightness of threads, low chaser costs, less downtime, more pieces per day.

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1¼" O.D. and smaller!

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To YOU, Anti-Corrosive's 25th Anniversary is an assurance that the oldest, largest and best known firm dealing exclusively in stainless steel fastenings is best suited to serve your needs in this field.
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Manufacturers of STAINLESS STEEL FASTENINGS
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Punches • Dies • Rivet Sets
Compression Riveter Dies
Made to highest standards and uniform quality thus insuring maximum service.
Since 1903
Large inventory of stock sizes of round punches and dies also rivet sets available for immediate shipment.
Square, rectangular, oblong and elliptical shapes made to order.
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—Technical Briefs—

Metal Cutting:

Hard-to-cut alloys are easily gouged, chamfered with new type electrode.

Gouging, chamfering and other metal cutting operations on hard to cut alloys are possible with a recently developed electrode.

The electrode, Eutectic's ChamferTrode, has a heavy coating which forms a cone at the striking end of the electrode, providing a jet effect arc. An intense, concentrated source of heat is created which removes metal so rapidly the metal itself remains relatively cool.

Surface of the gouged or chamfered material is said to be free from oxidation and slag, providing a clean surface for later brazing or welding operations.

Chamfering blast is so concentrated that warping on thin material is negligible. Physical properties of the base material are claimed to be unaffected.

The heavy coating is so designed that arc establishment is momentarily delayed, enabling the operator to pre-place the electrode at the point at which metal is to be removed before lowering his shield or protective glasses.

Regular DC welding machines are used as the power source. The chamfering electrode requires no auxiliary oxygen or special gases.

"Here's the problem. By renegotiation we stand to make another $30,000—but to substantiate it will cost us $25,000."

Controls Noose Choking Some Small Producers

Several small mills reduce operations . . . Blame declining order books . . . Wage-price question nearing climax . . . Washington sends up trial balloon . . . Industry shoots it down.

Steel controls, long a source of irritation, have become so constrictive that vital production is being lost. So far losses aren't large enough to affect the national operating rate much, but they will multiply if officials in Washington don't move more quickly to relax controls.

Worst of all, the controls' noose is choking small and nonintegrated steel producers the hardest. Last week one producer shut down two openhearth furnaces because of a declining order book. The company said military orders had failed to take up the slack caused by National Production Authority restrictions on civilian consumption of strip steel.

Other Cutbacks — Another mill has been operating its electric furnaces only 5 days a week for the past month. These furnaces were formerly operated 7 days a week. This company blames its production curtailment on the weak market for electrical sheets.

Beginning this week, still another mill (a nonintegrated producer) cut back from 5 to 4 days a week on its sheet finishing facilities — also due to lack of business.

This by no means exhausts the list of production curtailments which have been blamed on controls. THE IRON AGE previously reported cutbacks by a number of companies on products such as wire, mechanical tubing, electrical sheets, cold-rolled sheets and strip, and some specialty steel items.

How Strong?—Some of these producers have claimed they could quickly fill their order books if controls on their products were lifted. At the same time, some important consumers have indicated freedom to buy additional steel won't benefit them unless copper and aluminum quotas are also boosted.

Be that as it may—steel people feel that controls officials should make good on their pledge to lift controls, product by product, as soon as market conditions warrant. Those producers who have had to cut back production because of a declining order book are convinced the time to decontrol has already come—at least on some products.

Hard to Budge—Unless more relief is forthcoming soon, this will develop into a major issue. Further bungling of controls could boomerang against the Administration's efforts to get the Defense Production Act renewed with teeth.

The Administration will try to keep controls authority on the books as long as possible. Because of this, they will probably permit relaxation of restrictions on consumer use of easy-to-get products, rather than lifting them completely out of the Controlled Materials Plan.

Strike Danger—The steel wage-price controversy is another factor slowing decontrol. Everyone agrees that a steel strike would quickly reverse the easing trend of the market. This big question is quickly approaching its climax. The strike deadline is Mar. 24. Wage Stabilization Board is hurrying its recommendations in the hope that final agreement between union, industry and White House can be reached before that date.

So far, Washington's efforts to split the wage-price question into two parts have made no headway. Industry officials were angered last week by a trial balloon, believed to have emanated from Washington, to the effect that steel wages would go up 18½¢ while prices would be increased only $3 a ton. Such a price increase would be less than half what the industry insists it would have to get to cover a wage increase of 18½¢.

No Soap—If such a proposal were recommended, the industry would quickly reject it. Steel officials are against a wage increase at this time. And they are dead set against agreeing to one unless they are allowed a price increase to pretty well cover the higher costs. If the stabilizers don't walk gingerly and consider all the angles, they could force a shutdown of the steel industry.

Steel warehouses are working quickly to bring their inventories into balance. Some are cutting their buying of easier items such as cold-rolled sheets and strip. At the same time, they are redoubling their efforts to obtain heavy plates and structurals, cold-finished bars and oil country goods. The larger warehouses report overall inventories still far below the level they would like them to be.

Ingot Rate Up—The scrap market continues to ease. Rejections are increasing. And still mills are showing little interest in new tonnage not close to home. Steelmaking operations this week are scheduled at 102 pct of rated capacity, up half a point.

MicroRold®

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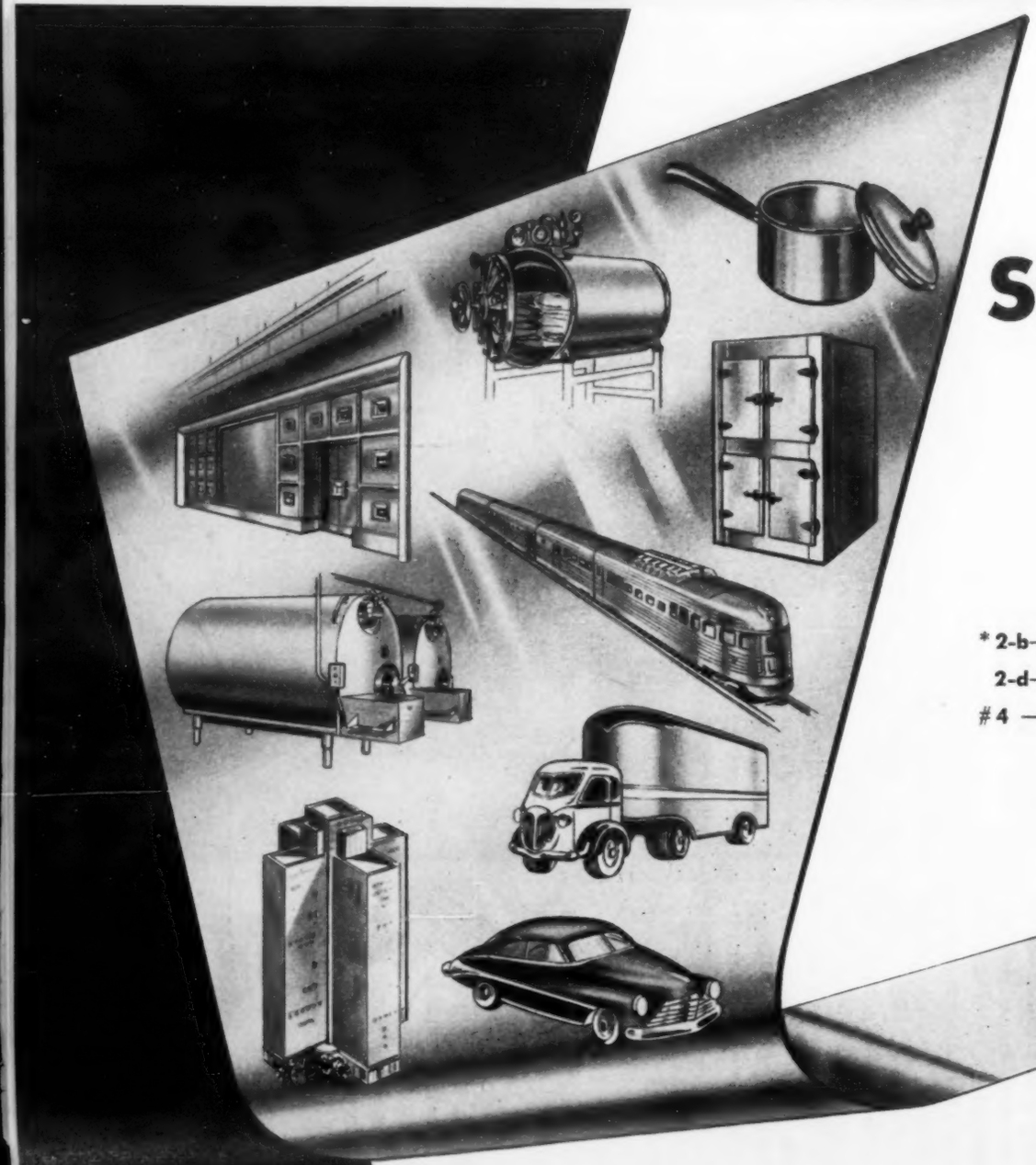
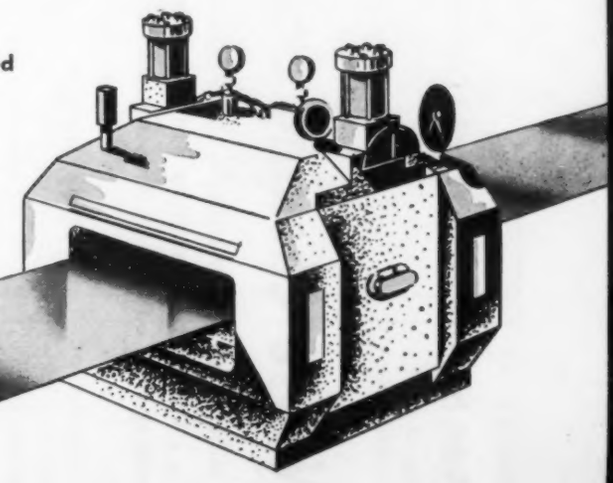
TYPE 430

now available in

No. 2-b, 2-d, and No. 4 FINISHES*





* 2-b—Annealed, pickled and re-rolled
2-d—Annealed and pickled only
4 —Standard polish

Extreme accuracy and uniformity of gauge provide more area per ton or an equivalent area with less weight.

Type 430 is more readily available than is the 18-8 grade.

Market Briefs

Big Haul—One of the largest single units of scrap steel ever delivered by a railroad was made available in Cleveland last week by the Erie R. R. Erie's contribution to the scrap mobilization program was 11 steam locomotives which had seen from 25 to 45 years' service. They will produce approximately 3000 tons of scrap.

More Boron—At a meeting of boron steel men in Detroit it was disclosed that the February melting of boron steel was up to 55,000 tons and that the Navy and Air Force, which formerly provided much of the resistance to the use of borons, are easing their attitudes. One company (International Harvester) reported that 62 pct of its total tonnage is in boron treated steels. The same company reported that nearly ¼ of its carburizing grades is now going into boron types.

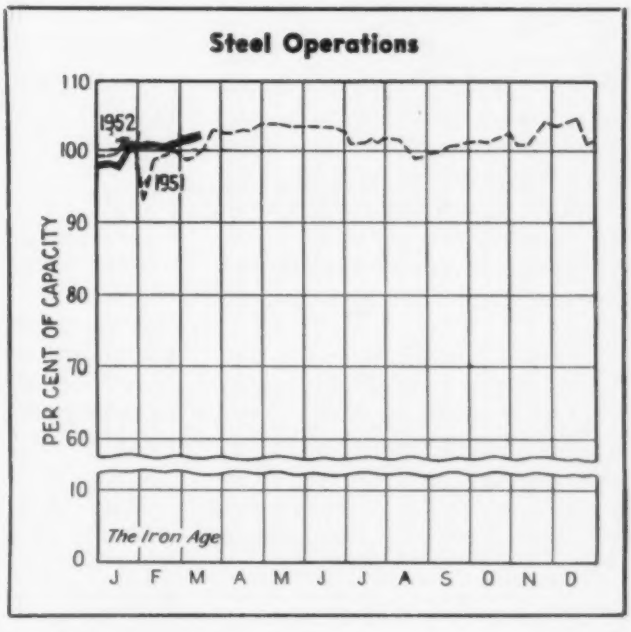
Steel for Britain—Questioned as to the grades of steel to be imported into Britain from the U. S. the Ministry of Supply was unable to say definitely how the tonnage would be broken up. Total would be 896,000 short tons and was likely to include ingots, semi-finished steel, hot-rolled coil, cold-rolled sheet, wire rods, bars, tube strip and alloy steel, but in what proportions depended on further contracts yet to be placed.

Zinc Better—Set-aside of zinc allocations for free-world countries may be attempted after July 1. International Materials Conference, allocating agency for a number of scarce items, says continued improvement in the zinc supply position might justify dropping of quota distribution. According to IMC, production has been increasing steadily. The agency planned allocation of 487,650 metric tons of zinc in the January-March quarter, 1952. It expects to increase this amount by about 20,000 tons in the second quarter.

No Biz—As of Monday, Sharon Steel Corp. shut down two 135-ton furnaces at its Roemer Works due to a declining order book. Sharon said military orders have failed to take up the slack caused by NPA restrictions on civilian consumption of strip steel. Electric furnace operations at the Brackenridge Plant of Allegheny Ludlum Steel Corp. have been at a reduced rate of 5 days per week for more than a month due to a weak market for silicon steel. Operations formerly were on a 7-day basis. Empire Steel Corp. this week dropped from a 5- to a 4-day week on sheet finishing mills due to lack of business.

Rail Strike—Wage rebellion against Army management struck New York Central, Pittsburgh & Lake Erie, Big Four, Michigan Central, and St. Louis Terminal railroads. It caused a transportation snarl-up that hung over the heads of steel producers and general industry. At press time in Cleveland, an injunction against the strikers had been prepared and been numbered. How effective that injunction would be remained to be seen, but it was the Army's only hope of early termination of the strike. There was a lot at stake.

Trade Swap—Germany is to send more steel to Britain under an agreement reached on Mar. 4, which runs to the end of the year. The talks did not include German scrap supplies, which are covered by a separate agreement running until next June. Germany is also to send scientific instruments, chemicals, dyestuffs and other products to the U.K. Requests by Germany for substantial deliveries of British coal during the current year to be included in the present agreement were not met, but small quantities of coal may be supplied under arrangements to be negotiated separately. Textile and office machinery are among the commodities which the U.K. will send to Germany.



District Operating Rates—Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	West	Buffalo	Cleveland	Detroit	Wheeling	South	Ohio River	St. Louis	East	Aggregate
Mar. 2	104.0	103.5	100.0	100.0	103.5*	104.0	101.5*	103.0	101.0	102.0	91.0	78.5	98.0	101.5
Mar. 9	105.0	103.0	101.0	100.0	104.5	104.0	101.0	103.0	101.0	102.0	91.0	78.5	86.5	102.0

Beginning Jan. 1, 1952, operations are based on annual capacity of 108,587,670 net tons.
* Revised.

Alcoa Fights Union Demands

USW charges only 5 pct Alcoa workers get "modest income" . . . Alcoa battling to keep costs low . . . Pressure may build up for higher aluminum prices—*By R. L. Hatschek.*

Aluminum labor hearings in Washington are following the same general pattern set by the steel hearings in New York. The union charged that less than 5 pct of Aluminum Co. of America workers get what Bureau of Labor Statistics calls "a modest weekly budget." Labor representatives also submitted a program of benefits substantially the same as demanded of the steel industry.

Alcoa stressed the expansion in its arguments against higher costs and union restrictions. The company pointed out that expanded aluminum capacity will require a far stronger sales effort and a competitive cost setup.

Prices Up?—Aluminum is the only major metal with a lower price today than it had in 1939. Much of the capital in the industry is being put right back into the huge expansion. Some costs are already higher and the new facilities are being built at the highest prices in history. All this pressure is building up under the present 19¢ per lb aluminum base price.

The major, if not the only, factor tending to hold down pressure for higher aluminum prices is the desire to keep the metal in a favorable position against competing metals. Sale of 1.5 million tons of aluminum per year in a normal market will be a tough job and a higher price would make it tougher. Despite rising production figures, we can expect to see increasing strength in arguments to raise the price along with the labor settlement.

AFL Next—Hearings of the United Steelworkers of America (CIO) case ended last Friday and the Aluminum Workers Council (AFL) hearings started on Monday. Their presentation is very similar to the steel union's.

Production Up—Aluminum production for the first month of the industry's first million-ton year totaled 76,934 tons compared to 72,454 tons for December. Barring unforeseen difficulties, this will be the lowest rate for the year—production is already hitting the monthly rate of about 78,000 tons and new plants are coming in fast.

Sheet and foil shipments were also higher while shipments of permanent and semi-permanent rough castings stayed at about the December level, according to the Aluminum Assn. Actual January quantities were: Foil, 6,537,465 lb; sheet and plate, 40,158 tons; and castings, 1078 tons.

Zinc Output Steady—Total February production of slab zinc at U. S. smelters was 77,296 tons as compared to 83,205 tons for the preceding month. The decrease is accounted for by the short month since daily average output was 2665 tons. This was close to the 2684-ton average of January and exceeded every month in 1951. Stocks held about even but unfilled orders increased about 15,000 tons.

Alter Zinc Order—National Production Authority's M-9, the zinc order, now incorporates all features of M-15 and M-37, which were revoked. The only major change is that quarterly as well as monthly allocations are now permissible. Other changes were new definitions of slab zinc and producers. Otherwise all zinc controls remain as they were.

Renew Tin Talks — At press time, the latest word from Washington was that the Bolivian, Belgian, Indonesian tin conference will be resumed this week. The Bolivian negotiations will be undertaken between a committee representing three U. S. agencies (General Services Administration, Reconstruction Finance Corp., and Office of Defense Mobilization) and Bolivian Ambassador Ricardo Martinez Vargas and representatives of the individual tin producing companies.

Earlier talks collapsed when neither side was able to agree on a price. The Bolivian producers wanted $1.50 per lb of tin in concentrates and RFC refused to go higher than $1.12. RFC would not go higher than $1.21½, delivered New York, for the Indonesians, who asked $1.25. The $1.21½ is the price being paid to Great Britain.

Lead Scrap Easing—Supply of scrap lead is good today with the result that demand is off and sales of quantity lots of soft lead are reported off ½¢ per lb. Battery smelting charges are now $47.50 to $55 per ton.

NONFERROUS METAL PRICES

	Mar. 5	Mar. 6	Mar. 7	Mar. 8	Mar. 10	Mar. 11
Copper, electro, Conn.	24.50	24.50	24.50	24.50	24.50	24.50
Copper, Lake delivered	24.625	24.625	24.625	24.625	24.625	24.625
Tin, Straits, New York	$1.215	$1.215	$1.215	....	$1.215	$1.215
Zinc, East St. Louis	19.50	19.50	19.50	19.50	19.50	19.50
Lead, St. Louis	18.80	18.80	18.80	18.80	18.80	18.80

Note: Quotations are going prices.

Nonferrous Prices

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet: 0.188 in., 2S, 3S, 30.1¢; 4S, 61S-O, 32¢; 52S, 34.1¢; 24S-O, 24S-OAL, 32.9¢; 75S-O, 75S-OAL, 39.9¢; 0.081 in., 2S, 3S, 31.2¢; 4S, 61S-O, 33.5¢; 52S, 35.6¢; 24S-O, 24S-OAL, 34.1¢; 75S-O, 75S-OAL, 41.8¢; 0.032 in., 2S, 3S, 32.9¢; 4S, 61S-O, 37.1¢; 52S, 39.8¢; 24S-O, 24S-OAL, 41.7¢; 75S-O, 75S-OAL, 52.2¢.

Plate ¼ in. and heavier: 2S, 3S-F, 28.3¢; 4S-F, 30.2¢; 52S-F, 31.8¢; 61S-O, 30.8¢; 24S-O, 24S-OAL, 32.4¢; 75S-O, 75S-OAL, 38.8¢.

Extruded Solid Shapes: Shape factors 1 to 5, 36.2¢ to 74.5¢; 12 to 14, 36.9¢ to 89¢; 24 to 26, 39.6¢ to $1.16; 36 to 38, 47.2¢ to $1.70.

Rod, Rolled: 1.5 to 4.5 in., 2S-F, 3S-F, 37.5¢ to 38.5¢; cold finished, 0.375 to 3 in., 2S-F, 3S-F, 40.5¢ to 35¢.

Screw Machine Stock: Rounds, 11S-T3, ⅛ to 11/32 in., 53.5¢ to 42¢; ⅜ to 1½ in., 41.5¢ to 39¢; 1 9/16 to 3 in., 38.5¢ to 36¢; 17S-T4 lower by 1.5¢ per lb. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in., 2S, 39.5¢ to 29¢; 52S, 48¢ to 35¢; 56S, 51¢ to 42¢; 17S-T4, 54¢ to 37.5¢; 61S-T4, 48.5¢ to 37¢; 75S-T6, 84¢ to 67.5¢.

Extruded Tubing, Rounds: 63S-ST-5, OD in in.: 1¼ to 2, 37¢ to 54¢; 2 to 4, 33.5¢ to 45.5¢; 4 to 6, 24¢ to 41.5¢; 6 to 9, 34.5¢ to 43.5¢.

Roofing Sheet, Flat: 0.019 in. x 28 in. per sheet, 72 in., $1.42; 96 in., $1.522; 120 in., $1,902; 144 in., $2,284. Gage 0.24 x 28 in., 72 in., $1.379; 96 in., $1.839; 120 in., $2.299; 144 in., $2.759. **Coiled Sheet:** 0.019 in. x 28 in., 28.2¢ per lb; 0.024 in. x 28 in., 26.9¢ lb.

Magnesium

(F.O.B. mill, freight allowed)

Sheet and Plate: FS1-O, ¼ in., 63¢; 3/16 in., 65¢; ⅛ in., 67¢; B & S Gage 10, 68¢; 12, 72¢. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam in., ¼ to 0.311 in., 74¢; ½ to ¾ in., 57.5¢; 1¼ to 1.749 in., 53¢; 2½ to 5 in., 48.5¢. Other alloys higher. Base up to ¾ in. diam, 10,000 lb; ¾ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M. In weight per ft, for perimeters less than size indicated, 0.10 to 0.11 lb, 3.5 in., 62.3¢; 0.22 to 0.25 lb, 5.9 in., 59.3¢; 0.50 to 0.59 lb, 8.6 in., 56.7¢; 1.8 to 2.59 lb, 19.5 in., 53.8¢; 4 to 6 lb, 28 in., 49¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb, ½ to 1.80 lb, 20,000 lb; 1.80 and heavier, 30,000 lb.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057; ¼ in. to 5/16, $1.40; 5/16 to ⅜, $1.26; ½ to ⅝, 93¢; 1 to 2 in., 76¢; 0.165 to 0.219, ⅞ to 1¼, 61¢; 1 to 2 in., 57¢; 3 to 4 in., 56¢. Other alloys higher. Base, OD in in.: Up to 1½ in., 10,000 lb; 1½ in. to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.

Titanium

(10,000 lb base, f.o.b. mill)

Commercially pure and alloy grades: Sheets and strip, HR or CR, $15; Plate, HR, $12; Wire, rolled and/or drawn, $10; Bar, HR or forged, $6; Forgings, $6.

Nickel and Monel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel
Sheets, cold-rolled	77	60½
Strip, cold-rolled	83	63½
Rods and bars	73	58½
Angles, hot-rolled	73	58½
Plates	75	59½
Seamless tubes	106	93½
Shot and blocks	..	53½

Copper, Brass, Bronze

(Freight prepaid on 200 lb)

	Sheet	Rods	Extruded Shapes
Copper	41.68	....	41.28
Copper, h-r	....	37.53	....
Copper, drawn	....	38.78	....
Low brass	39.67	39.36	....
Yellow brass	38.28	37.97	....
Red brass	40.14	39.83	....
Naval brass	43.20	37.26	38.52
Leaded copper	....	41.58	....
Com'l bronze	41.13	40.82	....
Mang. bronze	46.92	40.81	42.37
Phos. bronze	61.07	61.32	....
Muntz metal	41.18	36.74	37.99
Ni silver, 10 pct	49.82	52.04	....

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	19.00
Aluminum pig	18.00
Antimony, American, Laredo, Tex.	50.00
Beryllium copper, 3.75-4.25% Be	1.56
Beryllium aluminum 5% Be, Dollars per lb contained Be	$69.00
Bismuth, ton lots	$2.25
Cadmium, del'd	$2.55
Cobalt, 97-99% (per lb)	$2.40 to $2.47
Copper, electro, Conn. Valley	24.50
Copper, Lake, delivered	24.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium dollars per troy oz.	$200
Lead, St. Louis	18.80
Lead, New York	19.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex. 10,000 lb.	24.50
Magnesium, sticks, 100 to 500 lb.	42.00 to 44.00
Mercury, dollars per 76-lb. flask, f.o.b. New York	$207 to $210
Nickel electro, f.o.b. N. Y. warehouse	59.58
Nickel oxide sinter, at Copper Creek, Ont., contained nickel	52.75
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$90 to $93
Silver, New York, cents per oz.	88.00
Tin, New York	$1.215
Titanium, sponge	$5.00
Zinc, East St. Louis	19.50
Zinc, New York	20.20
Zirconium copper, 50 pct	$6.20

REMELTED METALS

Brass Ingot

(Cents per lb, delivered carloads)

85-5-5-5 ingot	
No. 115	27.25
No. 120	26.75
No. 123	26.25
80-10-10 ingot	
No. 305	33.00
No. 315	30.50
88-10-2 ingot	
No. 210	41.50
No. 215	40.00
No. 245	34.50
Yellow ingot	
No. 405	23.25
Manganese bronze	
No. 421	30.50

Aluminum Ingot

(Cents per lb, 10,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper, max.	20.6
0.60 copper, max.	20.4
Piston alloys (No. 122 type)	21.2
No. 12 alum. (No. 2 grade)	19.5
108 alloy	20.6
195 alloy	20.8
13 alloy	20.8
ASX-679	20.5

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97½%	18.80
Grade 2—92-95%	18.60
Grade 3—90-92%	18.40
Grade 4—85-90%	18.20

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	37.84
Electrodeposited	33¾
Flat rolled	38.34
Forged ball anodes	43
Brass, 80-20	
Cast, oval, 15 in. or longer	34¾
Zinc, oval	26½
Ball anodes	25½
Nickel 99 pct plus	
Cast	76.00
Rolled, depolarized	77.00
Cadmium	$2.80
Silver 999 fine, rolled, 100 oz lots, per troy oz., f.o.b. Bridgeport, Conn.	97½

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum	63
Copper sulfate, 99.5 crystals, bbl.	12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed	20½
Nickel chloride, 375 lb drum	27½
Silver cyanide, 100 oz lots, per oz.	67¼
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc cyanide, 100 lb drum	47.7

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add ½¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	21½	20¾
Yellow brass	19½	17⅞
Red brass	20½	19⅝
Comm. bronze	20½	19⅝
Mang. bronze	18½	17¾
Brass rod ends	18⅞	....

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	19.25
No. 2 copper wire	17.75
Light copper	16.50
Refinery brass	17.25*
Radiators	14.75

* Dry copper content.

Ingot Maker's Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	19.25
No. 2 copper wire	17.75
Light copper	16.50
No. 1 composition	18.50
No. 1 comp. turnings	18.25
Rolled brass	15.50
Brass pipe	16.50
Radiators	14.75
Aluminum	
Mixed old cast	9.75
Mixed new clips	11.00
Mixed turnings, dry	9.50
Pots and pans	9.25

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	18¾—19¼
No. 2 heavy copper and wire	17¼—17¾
Light copper	16 —16½
New type shell cuttings	16 —16½
Auto radiators (unsweated)	14¼—14¾
No. 1 composition	18 —18½
No. 1 composition turnings	17¾—18
Unlined red car boxes	16¾—17¼
Cocks and faucets	15½—16
Mixed heavy yellow brass	12 —12½
Old rolled brass	15 —15½
Brass pipe	16 —16½
New soft brass clippings	16 —16½
Brass rod ends	15½—16
No. 1 brass rod turnings	15 —15½

Aluminum

Alum. pistons and struts	6½— 7½
Aluminum crankcases	7½— 8
2S aluminum clippings	10½
Old sheet and utensils	7½— 8
Borings and turnings	5 — 6
Misc. cast aluminum	7½— 8
Dural clips (24S)	7½— 8

Zinc

New Zinc clippings	13¼—13½
Old zinc	10 —10¼
Zinc routings	6¾— 7
Old die cast scrap	6¾— 7

Nickel and Monel

Pure nickel clippings	35 —36
Clean nickel turnings	35 —36
Nickel anodes	35 —36
Nickel rod ends	35 —36
New Monel clippings	28 —29
Clean Monel turnings	20 —21
Old sheet Monel	28 —29
Nickel silver clippings, mixed	13 —14
Nickel silver turnings, mixed	12 —13

Lead

Soft scrap, lead	15¾—16
Battery plates (dry)	10 —10½
Batteries, acid free	7 — 7¼

Magnesium

Segregated solids	15 —16
Castings	14 —15

Miscellaneous

Block tin	100 —110
No. 1 pewter	80
No. 1 auto babbitt	60
Mixed common babbitt	16¼—16½
Solder joints	22 —23
Siphon tops	60
Small foundry type	21 —22
Monotype	18½—19
Lino. and stereotype	17½—18
Electrotype	16 —16½
Hand picked type shells	10 —11
Lino. and stero. dross	8¾— 9
Electro. dross	7½— 8

Is New Respect Needed for Scrap?

Pressure from buyers deflates . . . Market basically strong but on-again, off-again demand shown possible . . . Scrap trade invests too much to afford bad slump . . . Seek steady buying.

Industry in general can be relied upon to gloss over bitter shortage lessons and revert to normal buying practice when supply eases. Steel mills are no longer prodding the scrap trade for shipments and temporarily, at least, scrap will become a raw material that's just there, to be called upon when needed. In an understandable drive to cut costs, scrap buyers are shortening freight runs, shunning in-transit preparation scrap, and becoming purists on quality.

What does this portend for the scrap industry? In recent years it has invested millions of dollars in yard space and new machinery to prepare for long-term demand. No scrap man seriously believes that good scrap will go begging this year or next but deflated pressure from mill buyers reminds him that on-again, off-again demand is possible in scrap. The scrap industry's investment and its establishment as big business lowers its capacity to contract and expand as inconsistent demand warrants. Scrap men feel that their product should be recognized as the invaluable raw material it is and bought as consistently as other materials.

To protect their future supply, mills should be careful not to damage the now powerful scrap collection machine. Some scrap men believe that the easy attitude of mills now proves that mill scrap thinking has not changed a jot. They say this attitude is not warranted because scrap is still in shortage and stockpiles are but a fraction of their former selves.

In nearly all districts last week the scrap flow was mounting. Purchasing agents continued to limit freight runs.

Pittsburgh—Scrap is pouring into the area by rail and barge. A large consumer last week was on the verge of ordering dealers to hold up shipments due to congestion at mill receiving stations. The mills are steadily building up inventories. Rejections and downgrading are brisk. The situation is the reverse of what it was less than 2 months ago: Mills are now particular and dealers are anxious to ship. The turnings market is weakening. Cast continues soft.

Chicago—Openhearth and electric furnace scrap continue to move strongly and inspections have become tighter. But at least one mill reports its reserve falling slightly. Cast scrap remains at rock bottom. As cast commitments are fulfilled, few new contracts are being written. Although easier, electric furnace grades continue to sell well and at ceiling. Machine shop turnings continue to show a slight decrease in turnover.

Philadelphia — The market here shows little change from last week. Mills are restricting shipments and will not accept truck shipments. Cast remains weak with prices unchanged this week. Heavy breakable is still at ceiling with an $8-freight limit because most dealers find it worthwhile to break it up. Unstripped motor blocks are hardly moving despite a $40 delivered price.

New York—Movement of openhearth grades is improving and stockpiles are losing a little of that lean look—but not much of it. The trade is watching quality of shipments to avoid trouble with mill inspectors and OPS men. Pressure for scrap from mills is deflating and some scrap people believe that a nonchalant attitude on the part of the mills could deter the spring flow of scrap. No substantial sales of cast were reported.

Detroit—Steel scrap market remains unchanged here. No below-ceiling sales except for cast grades were reported though there is evidence that some scrap people are flirting with the idea. Cast prices were established below ceiling in most grades with only clean auto cast continuing scarce. Brokers report they can sell some cast at ceilings but their buying prices range from $2 to $3 below ceilings. Example: Heavy breakable delivered at Kokomo, Ind., at $45.

Cleveland—The market here showed little activity this week. Openhearth and electric furnace grades are still moving well. Mills are not putting on the pressure as in the past and regrading and rejections are on the increase. Scrap originating on struck lines of New York Central R.R. is being trucked out. Movement of blast furnace grades continues sluggish with some shipped out of the area.

St. Louis—A sale was reported last week of several hundred tons of stove plate at a price tantamount to $10 a ton below the ceiling. Sale was made at a price of $42 a ton delivered in the district, whereas the on-track ceiling is $47, with freight amounting to $5 a ton. Movement of openhearth grades is improving. Mills' receipts are equal to consumption for the first time in months. Mills have cut the "springboard" for brokers to $4.

Birmingham—Steel mills here have stopped crying for scrap, at least temporarily. No new allocations are being received, but some are still receiving scrap on old allocations. One mill has informed brokers it is out of the market until Mar. 15. There still is no market for cast scrap.

Cincinnati—Mills are absorbing all local scrap but continue to back away from shipments involving long freight rates or in-transit preparation. Openhearth and low phos grades are in good demand but mills are inspecting more closely. Flow of scrap is being slowed up by strike on New York Central lines. However, comfortable mill inventories and truck shipments are expected to tide the mills over.

Boston—Below-ceiling prices for cast grades still hold. Movement of premium grade steel scrap grades has improved but sales continue at full ceiling. Not much cast is moving because of erratic and poor demand.

Buffalo — New allocations have helped a large mill here. Mild weather has helped a major junk yard clear out its stock. Interest in cast is at an ebb.

Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size.

F.o.b. Niagara Falls, Alloy, W. Va.	
Ashtabula, O.	$185
F.o.b. Johnstown, Pa.	187
F.o.b. Sheridan, Pa.	185
F.o.b. Etna, Clairton, Pa.	188

$2.00 for each 1% above 82% Mn, penalty, $2.15 for each 1% below 78%. Briquets—Cent sper pound of briquet, delivered, 66% contained Mn.

Carload, bulk	10.95
Ton lots	12.55

Spiegeleisen

Contract prices gross ton; lump, f.o.b.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Palmerton, Pa.	$74.00	$75.00
Pgh. or Chicago	75.00	76.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

96% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	34.75
Ton lots	36.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	28
Ton lots	30
Less ton lots	32

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb. of contained Mn ..... 19.15¢

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Sillicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max, C. For 2% max. C, deduct 0.2¢.

Carload bulk	9.90
Ton lots	11.55
Briquet, contract basis carlots, bulk delivered, per lb of briquet	11.15
Ton lots	12.75

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $92.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $90.00. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.

96% Si, 2% Fe	21.70
97% Si, 1% Fe	22.10

Silicon Briquets

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 2 lb Si briquets.

Carload, bulk	6.95
Ton lots	8.55

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.

25% Si	20.00	75% Si	14.30
50% Si	12.40	85% Si	15.55
90-95% Si			17.50

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.7% max. C, 0.06% P, 90% Mn	26.25	28.10	29.30
0.67% max. C	25.75	27.60	28.80
0.15% max. C	25.25	27.10	28.30
0.30% max. C	24.75	26.60	27.80
0.50% max. C	24.25	26.10	27.30
0.75% max. C, 7.00% max. Si	21.25	23.10	24.30

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.

Carload	9.90¢
Ton lots	11.30¢

Calcium molybdate, 46.3-46.6%, f.o.b. Langeloth, Pa., per pound contained Mo $1.15

(For other ferroalloy Prices see p. 151, February 21, 1952)

Other Ferroalloys

Ferrocolumbium, 50-60%, 2 in. x D, contract basis, delivered, per pound contained Cb.

Ton lots	$4.90
Less ton lots	4.95

Ferro-Tantalum-columbium, 20% Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2in x D, per lb of contained Cb plus Ta $3.75

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo $1.32

Ferrophosphorus, electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton $65.00

10 tons to less carload 75.00

Ferrotitanium, 40%, regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50

Less ton lots 1.55

Ferrotitanium, 15 to 18%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $177.00

Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W, 5 ton lots, delivered $5.00

Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained V.

Openhearth	$3.00-$3.10
Crucible	3.10- 3.20
High speed steel (Primos)	3.20- 3.25

Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa. $1.14

bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.13

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound

Carload, bulk lump	14.50¢
Ton lots, bulk lump	15.75¢
Less ton lots, lump	16.25¢

Vanadium pentoxide, 86-89% V_2O_5 contract basis, per pound contained V_2O_5 ..... $1.28

Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.

Ton lots	21.00¢

Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.

Carload, bulk	7.00¢

Boron Agents

Contract prices per lb of alloy, del. Borosil, f.o.b. Philo, Ohio, freight allowed, B, 3-4%, Si, 40-45%, per lb contained B $5.25

Bortam, f.o.b. Niagara Falls

Ton lots, per pound	45¢
Less ton lots, per pound	50¢

Corbortam, Ti, 15-21%, B, 1-2%, Si, 2-4%, Al, 1-2%, C, 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.

Ton lots, per pound	10.00¢

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots $1.20

F.o.b. Wash., Pa.; 100 lb up

10 to 14% B	.85
14 to 19% B	1.20
19% min. B	1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.

No. 1	$1.00
No. 6	68¢
No. 79	50¢

Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe. 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd

Ton lots	$1.46
Less ton lots	1.57

Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.

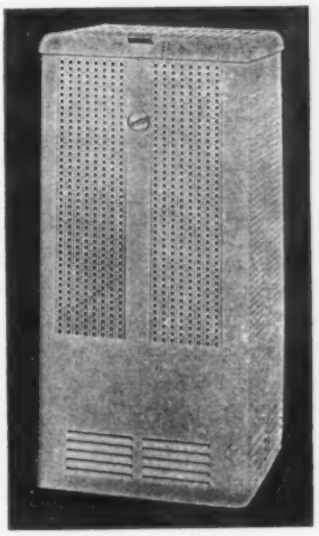
Less ton lots	$1.80

Silcaz, contract basis, delivered.

Ton lots	45.00¢

Hendrick Ornametal

TRADE MARK



Hendrick Ornametal is a decorative, lightweight metal grille suitable for a wide variety of applications, such as for stove panels as shown in the illustration.

Furnished in a wide variety of attractive designs, Ornametal is made of a special bright finish, cold rolled steel, suitable for painting or plating, and is available in a wide range of stock size sheets and gauges.

Write for full information

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Hill Clutch & Machine & Fdry. Co. Open Side Abrasive Belt Grinding Unit, Designed to accommodate slabs up to ⅜" thick x 30" wide x 30' long.

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2" AJAX Upsetting and Forging Machine

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15 ton Heroult Model V-12 Electric Melting Furnace, Top Charge hydraulically operated. Complete with Transformer Equipment

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10,000 lb. Chambersburg Steam Drop Hammer.

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60" x 60" x 12' Niles-Bement-Pond, Four Head
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40 KVA Sciaky, Spot Welder, 36" Throat 440/3/60 operation

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The Clearing House

NEWS OF USED, REBUILT AND SURPLUS MACHINERY

What About Prices—Pricing in the used and rebuilt machine tool market has been harassing dealers for a long time. Patiently they have been waiting for a guide to clarify price schedules. OPS has so far failed to help. Ceiling schedules have offered as much confusion as they have a basis for equipment pricing.

Below ceiling sales of a few "good" radial drills in the New England area have been reported. Although several pre-1940 items have been selling under ceilings there is now also a tendency for some later models to sell at prices below OPS schedules.

Cleveland Market—A slight slackening of pressure for used machine tools has been noticed according to some sources. While inquiries continue to come in at high levels there seems a tendency among buyers to wait until they have given the field a good once over before making their purchases. Buyers seem to be more particular about the machines they will accept.

This attitude may be due to reports of flattening out of the defense program and a slight decline in industrial activity. This does not mean that sales are off. The outlook for the Cleveland market is still sound.

Demand for late type equipment is still high yet one dealer reported that he has several post-1940 machine tools for which he hasn't found buyers. No doubt a buyer will be found, but it was pointed out that 6 months ago they would have been turned over immediately.

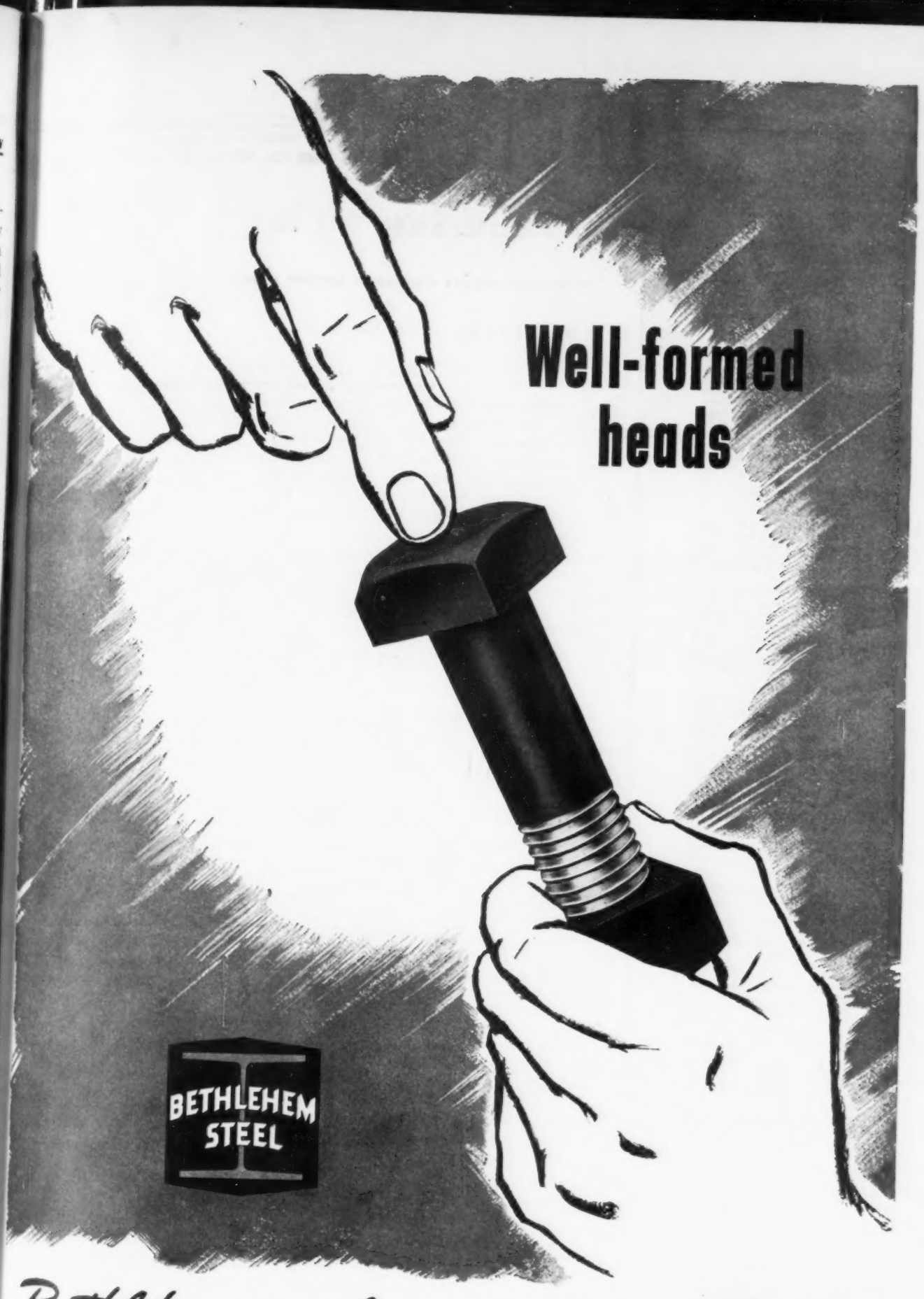
Generally Speaking — Machine tools of older vintage have not yet started to sell in as great a volume as has been expected. This is true in generally all areas. Smaller plants which normally would be big users in this field have not come out in great numbers for them. Some sources say that small manufacturers are in fairly good financial standing and may be looking for new or later types of machine tools rather than the older models.

Cleveland dealers are still hard pressed to pick up good late type items. In some cases the user's asking price is too close to ceiling and the dealer's margin of profit too slim. On the other hand, some older tools are being sold at under ceiling prices.

Setting Standards—Distribution has been made to members of American Rebuilders Assn. of a draft of rebuilding standards. When comments and suggestions are returned, the revised set will be submitted to users for their approval. Following general acceptance, the standards will then be offered to the American Standards Assn. for its approval.

Other Markets—A New England rebuilder grants that good machine tools of any kind readily become part of an active market in that area. He offers turret lathes and heavy duty milling machines as being most critical. In the New York area it appears that the market is virtually depleted of all late model tools. Demand for machine tool equipment remains keen but buyers are reluctant to consider the older types.

With a likelihood of relaxing some controls, the trade is anticipating a growing demand for press brakes, shears and similar equipment. Such demand will only become appreciable when more metal is available for civilian goods production. Likewise, small manufacturers who have decided against purchases, as a result of civilan goods cutbacks, may decide to buy equipment scouted out when anticipating possible defense contracts.



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